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# FAMILY ECONOMICS REVIEW

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**FAMILY ECONOMICS REVIEW** is a quarterly report on research relating to economic aspects of family living. It is prepared primarily for home economics agents and home economics specialists of the Cooperative Extension Service.

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**FAMILY ECONOMICS REVIEW**

# NUTRITIVE VALUE OF FOOD INTAKES: RESULTS FROM THE USDA NATIONWIDE FOOD CONSUMPTION SURVEY 1977-78

Detailed information on the food intake of individuals at home and away from home is available from the USDA Nationwide Food Consumption Survey 1977-78 (NFCS).<sup>1</sup> The first two articles in this issue of *Family Economics Review* were developed from papers presented at the Agricultural Outlook Conference in November 1980,<sup>2</sup> and provide information on the nutrient content of foods consumed by individuals and from meals and snacks of those individuals.

The data were collected on all foods and beverages eaten at home and away from home by members of a national sample of households. Information was collected from 1-day recalls of 9,620 individuals living in 48 conterminous States in April to June 1977. Energy and nutritive values of food intakes were calculated from composition data in Agriculture Handbook No. 8,<sup>3</sup> including recently revised sections, and from data supplied by manufacturers.

The first article, "Nutrients in foods at home and away," by Guenther and Chandler, describes nutrients in foods eaten at home and away by men, women, and children of various ages. Such information is of special importance because eating out became so common between 1965 and 1977. In 1965, meals and snacks purchased and eaten away from home accounted for 17 cents out of the household food dollar; by 1977 this share had increased to 24 cents.<sup>4</sup> The second article, "Nutrients from meals and snacks consumed by individuals," by Pao and Mickle, describes the nutrient content of meals and snacks. Such data are important because people usually eat combinations of foods rather than a single food for a meal. Meal and snack patterns may be changing, along with changes in life styles, introduction of new foods into the marketplace, and the increase in eating away from home. The effects of such changes should be delineated. Therefore, the percentage of the day's nutrient intake provided by the meal or snack and the nutrient density (nutritive value per 1,000 kcal) are used to describe meals and snacks reported. Nutrient density is one measure of nutrient quality of assortments of foods selected.

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<sup>1</sup> A detailed description of the purpose of the survey, the methodology, and appropriate uses of the data appears in the Fall 1978 issue of *Family Economics Review*.

<sup>2</sup> Copies of the complete papers are available from the Consumer Nutrition Center, U.S. Department of Agriculture, Room 325A, Hyattsville, Md. 20782.

<sup>3</sup> Watt, B. K., and Merrill, A. L., 1963, Composition of foods . . . raw, processed, prepared. U.S. Department of Agriculture, *Agriculture Handbook* 8 (rev.), 190 pp.

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<sup>4</sup> See "Money value of food used by households in the United States, 1977," 1980, Preliminary Report No. 1, U.S. Department of Agriculture, Consumer and Food Economics Institute.



# NUTRIENTS IN FOODS AT HOME AND AWAY<sup>1</sup>

By Patricia M. Guenther and Carolyn A. Chandler<sup>2</sup>

Foods eaten away from home make important contributions to nutrient intakes. On the average, foods eaten out provided 19 percent of energy, protein, fat, and carbohydrate and 15 to 18 percent of the vitamins and minerals studied. The nutrient contribution of food away from home varied with age of individuals from 1 to 2 percent of the day's intake for infants up to 20 to 25 percent for young adults (19 to 34 years). The nutrient contribution of food away then decreased with advancing age to about 10 percent.

## Individuals Eating Away From Home

Of the individuals surveyed, 44 percent had food or beverage away from home on the 24-hour day preceding the interview. This proportion increased progressively with age from 6 percent for infants to a peak among males of 60 percent at 23 to 34 years and to a peak among females of 55 percent at 12 to 14 years. The percentage eating away from home then decreased with advancing age to 23 percent for men and women of 65 to 74 years and to about 16 percent for those 75 and older.

Percentages for those eating out for males under 22 and over 65 years were similar to those for females. However, many more men than women 23 to 64 years ate away from home.

In a similar 1965 survey, 39 percent of the individuals obtained and ate some food away from home compared with 44 percent in 1977. The sex-age group with the greatest increase since 1965 was women at 23 to 34 years. In

1965, 35 percent of this group had food away from home on the day surveyed; in 1977, close to 50 percent had eaten out. The next largest increase was for children 3 to 5 years; 24 percent of them had food away from home in 1965 compared with 33 percent in 1977. These increases probably reflect the greater numbers of young women in the work force and the care of their children outside the home.

## Energy From Food at Home and Away

The average shares of food energy and of each of the energy-providing nutrients—fat, protein, and carbohydrate—coming from food away from home were almost identical to each other for all individuals studied. The proportions, however, varied considerably by the sex and age of individuals (table 1). Non-breast-fed infants received only 2 percent of their energy intakes from foods eaten away from home, but at 1 and 2 years about 10 percent came from foods away from home. In general, the proportion of energy provided by food away from home increased with age to about 25 percent for men and women 19 to 34 years, and then declined with increasing age to about 7 percent for those 75 and over.

About 80 percent of the day's energy intake came from foods at home, and about 20 percent came from foods away from home (table 2). The meat-egg group<sup>3</sup> contributed the largest proportion of energy in foods at

<sup>1</sup>"Food eaten out" or "food away from home" refers to food that was obtained and eaten outside the individual's home, for example, in a restaurant, at school, at work, or at someone else's home. Food that was purchased at a store and eaten away from home is also considered "food away." Food that is carried from the home and eaten elsewhere, such as bag lunches and picnics, is from the home food supply and is considered "food at home."

<sup>2</sup>Consumer Nutrition Center, Human Nutrition, Science and Education Administration, U.S. Department of Agriculture.

<sup>3</sup>For this study, foods were classified into five major groups: Milk and milk products, meat-egg, grain products, fruits and vegetables, and fats-sweets-beverages (or "other"). Milk and milk products include cheese, yogurt, cream, and such milk product mixtures as puddings and cheese sandwiches. The meat-egg group also includes fish, poultry, and mixtures having one of these foods as a main ingredient, such as sandwiches, stews, and TV dinners. The grain products group includes breads, rolls, biscuits, other baked goods, cereals, pastas, and their mixtures. The fruits and vegetables group includes juices, legumes, nuts, and seeds. The last group, "other," includes such beverages as coffee, tea, soft drinks, fruit drinks, fruit ades, and alcoholic drinks, and sweets, sugar, fats, and oils that were reported separately by the respondent.

Table 1. Nutritive value of food obtained and eaten away from home  
[Percentage of day's<sup>1</sup> intake per individual]

Sex and age (years)	Individuals (number)	Individuals eating away (percent)	Food energy	Pro- tein	Fat	Carbo- hydrate	Cal- cium	Iron	Magne- sium	Phos- phorus	Vita- min A	Thia- min	Ribo- flavin	Pre- formed niacin	Vita- min B <sub>6</sub>	Vita- min B <sub>12</sub>	Vita- min C
<b>Males and females:</b>																	
Under 1 . . . . .	<sup>2</sup> 78	6.4	1.9	1.7	2.1	1.8	1.4	1.5	1.5	1.5	2.0	0.8	1.1	1.1	2.0	1.7	2.1
1-2 . . . . .	<sup>3</sup> 264	25.0	9.6	9.0	9.7	9.7	7.4	8.7	8.3	8.4	7.3	8.1	7.8	9.4	8.4	7.9	8.1
3-5 . . . . .	437	33.4	14.3	13.9	14.4	14.3	11.9	13.1	13.1	13.0	10.4	12.2	12.2	13.6	12.4	12.2	11.7
6-8 . . . . .	469	49.7	19.6	19.8	20.2	19.1	20.5	17.0	18.7	19.8	17.0	16.7	18.7	17.6	17.0	19.6	17.3
<b>Males:</b>																	
9-11 . . . . .	216	51.4	20.2	19.9	20.8	20.1	20.0	18.1	18.7	19.5	18.3	16.8	18.7	18.6	18.0	19.7	18.0
12-14 . . . . .	313	54.0	19.7	19.8	19.6	20.1	22.0	17.7	19.6	20.6	17.3	17.8	19.6	17.3	17.3	20.3	16.8
15-18 . . . . .	400	55.0	21.2	20.7	21.5	21.4	20.6	19.0	19.4	20.8	16.0	18.6	19.7	19.3	17.9	20.6	15.3
19-22 . . . . .	287	52.3	24.3	23.4	23.8	24.3	20.7	22.8	22.0	22.8	20.7	20.6	21.1	22.9	22.7	21.9	21.9
23-34 . . . . .	770	60.4	26.6	25.7	26.5	26.7	24.3	25.8	25.0	25.6	22.0	24.5	24.7	26.3	24.7	25.4	21.1
35-50 . . . . .	784	54.3	22.0	21.5	21.6	22.3	20.6	21.1	21.1	21.5	19.5	20.2	21.1	22.1	20.7	21.4	19.1
51-64 . . . . .	634	39.0	15.2	15.2	15.0	15.3	14.1	14.5	14.0	14.8	13.8	13.5	14.5	15.1	14.3	14.9	11.8
65-74 . . . . .	295	23.1	10.5	10.7	11.0	9.8	7.7	9.7	8.8	9.4	8.7	8.1	8.2	10.5	9.4	9.4	8.4
75 and over . . .	127	16.5	7.6	8.2	8.3	6.4	5.7	7.1	6.8	7.1	6.6	5.8	5.7	8.1	7.0	7.3	6.1
<b>Females:</b>																	
9-11 . . . . .	241	49.4	20.3	21.0	21.7	19.4	20.8	18.3	18.7	20.3	16.7	17.2	19.3	18.4	17.5	20.5	15.7
12-14 . . . . .	309	55.3	19.9	18.7	20.0	20.7	19.6	17.6	18.9	19.5	15.6	17.5	18.2	17.9	16.7	18.7	16.0
15-18 . . . . .	402	52.2	25.0	24.6	25.3	25.1	23.7	23.6	23.6	24.6	20.7	21.3	23.2	23.5	23.3	24.6	19.6
19-22 . . . . .	337	50.1	25.1	24.5	24.5	25.5	22.6	24.6	24.3	24.3	22.9	23.2	23.5	24.7	24.7	24.0	21.2
23-34 . . . . .	949	47.5	23.6	23.0	24.1	22.9	21.5	23.0	22.2	22.6	21.4	22.3	21.8	23.1	22.4	22.0	21.0
35-50 . . . . .	942	40.6	18.0	17.5	18.3	17.6	16.8	17.1	16.4	17.3	15.9	16.5	16.6	17.1	16.8	16.7	15.1
51-64 . . . . .	792	32.8	13.3	12.9	13.9	12.8	11.9	12.2	11.8	12.6	11.9	11.6	12.0	12.4	11.9	12.8	9.9
65-74 . . . . .	377	23.1	11.6	12.1	12.4	10.4	9.9	10.7	9.7	11.0	10.7	9.5	10.4	11.2	10.6	11.4	7.1
75 and over . . .	197	15.2	7.4	8.4	8.5	5.9	6.5	6.8	6.2	7.4	6.2	5.9	6.7	7.3	7.3	7.7	5.3
All individuals . .	<sup>4</sup> 9,620	43.7	18.8	18.5	19.0	18.6	17.5	17.6	17.5	18.2	16.2	16.7	17.3	18.0	17.2	17.9	15.4

<sup>1</sup> Based on 24-hour dietary recall of day preceding interview.

<sup>2</sup> Excludes 36 breast-fed infants.

<sup>3</sup> Excludes 4 breast-fed infants.

<sup>4</sup> Excludes 40 breast-fed infants.

Source: U.S. Department of Agriculture, Science and Education Administration, Consumer Nutrition Center, 1980, Food and nutrient intakes of individuals in 1 day in the United States, spring 1977, USDA Nationwide Food Consumption Survey 1977-78, Preliminary Report 2, p. 96.



home and away. Foods in the meat-egg group contributed 25 percent of the day's energy intake at home and 6 percent away from home. The next largest energy source was the grain products group, with about 20 percent of the day's energy coming from grain products at home and 4 percent coming from grain products eaten away. At home, fruits and vegetables made a slightly greater contribution to energy (14 percent) than did milk (12 percent) or the foods in the "other" category (about 10 percent). Away from home, the food energy from these three food groups was evenly divided (2 to 3 percent each).

The meat-egg group supplied the largest proportion of protein in the diets, as would be expected. Foods in this group at home provided about 40 percent of protein. Within the group, eggs provided 4 percent. The meat-egg group eaten away from home supplied another 10 percent of protein. The contribution from eggs away was only 0.5 percent. Milk and milk products and grain products were equally important sources of protein among foods at home and away; each supplied about 15 percent of total protein intake at home and about 3 percent away from home. Fruits and vegetables at home were the source of about 10 percent of protein and provided less than 2 percent of protein away from home.

The meat-egg group was also the major source of fat in the diet. Foods in this group contributed 37 percent of all fat at home and 9 percent away from home. The milk and milk products group was the next most important source of fat, contributing 14 percent at home and 3 percent away from home. The other three major food groups contributed similar equal amounts of fat to the diet—9 to 12 percent each in foods at home and 2 to 3 percent in foods away.

### **Vitamins A, C, and B<sub>6</sub> and Iron From Food at Home and Away**

Foods at home and foods away from home differed more in their contents of vitamins A and C than they did for any other nutrient. Foods at home supplied a larger proportion of vitamin A and vitamin C than energy nutrients. For older adults (65 to 74), however, foods at home supplied the same proportion of vitamin A and energy.

Foods away from home supplied 10 percent of the vitamin A for children 3 to 5 years, 16 percent for teenage boys (15 to 18 years), and 21 percent for teenage girls. The proportions of vitamin A from foods away from home were highest for women 19 to 22 years (23 percent) and for men 23 to 34 years (22 percent). By age 65 to 74 these proportions had fallen to about 10 percent.

Fruits and vegetables supplied 35 percent of the day's vitamin A intakes at home and another 7 percent away from home. Tomatoes and dark-green and deep yellow vegetables were important sources of vitamin A. The contribution of white potatoes to intake of vitamin A came mainly from added butter or margarine. Legumes, nuts, and seeds supplied negligible amounts. The remaining vegetables provided the largest proportion of vitamin A, 13 percent at home and 3 percent away.

The milk, meat-egg, and grain products groups contributed 13 to 16 percent each to intakes of vitamin A at home and 2 to 3 percent each away. Eggs accounted for over a third of the meat-egg group's contribution at home (4.8 percent of the 12.5 percent) and only a fifth of this group's contribution away from home (0.6 percent of the 3.2 percent). Eggs were eaten much more frequently at home than away from home.

Fruits and vegetables were major sources of vitamin C. Those at home furnished nearly 60 percent of the total day's intake, and those away furnished about 10 percent. Citrus fruits and tomatoes supplied a fourth of the vitamin C, most of it at home. Among all foods eaten away, potatoes were the most important source of vitamin C, supplying 4 percent of the total intake. The remaining four major food groups supplied 4 to 8 percent of vitamin C intake from foods at home and 1 to 2 percent each from foods away from home.

Sources of vitamin B<sub>6</sub> were more evenly distributed among the food groups than were sources of vitamin A and vitamin C. About 83 percent came from food at home—33 percent from the meat-egg group, 22 percent from fruits and vegetables, 17 percent from grain products, 9 percent from milk and milk products, and 2 percent from fats, sweets, and beverages. About 17 percent of vitamin B<sub>6</sub> came from foods away from home—9 percent



Table 2. Contribution of food groups at home and away to nutrient intakes  
[Average per individual in a day]<sup>1</sup>

Food group	Food energy		Protein		Fat		Calcium		Iron		Vitamin A		Vitamin B <sub>6</sub>		Vitamin C	
	Home	Away	Home	Away	Home	Away	Home	Away	Home	Away	Home	Away	Home	Away	Home	Away
<i>Percent</i>																
Milk-milk products . . . . .	11.6	2.2	15.1	2.6	14.1	2.7	39.0	6.9	3.0	0.6	15.9	3.1	9.3	1.5	6.6	0.9
Meat-egg . . . . .	24.7	6.4	40.7	10.6	36.9	8.9	8.7	3.1	29.8	8.1	12.5	3.2	33.3	8.7	4.0	1.9
Grain products . . . . .	20.8	4.3	15.5	3.2	11.7	3.1	18.7	4.0	28.6	4.4	14.3	2.1	16.6	2.1	8.0	1.3
Fruits-vegetables . . . . .	13.6	2.7	9.4	1.8	9.3	2.7	12.4	2.2	16.6	3.2	35.2	7.0	22.0	4.1	59.1	10.6
Fats-sweets-beverages . . . . .	10.5	3.2	.8	.3	9.0	1.6	3.7	1.3	4.3	1.4	5.9	.8	1.6	.8	6.6	1.0
All foods . . . . .	81.2	18.8	81.5	18.5	81.0	19.0	82.5	17.5	82.3	17.7	83.8	16.2	82.8	17.2	84.3	15.7

<sup>1</sup> Based on 24-hour dietary recall of day preceding interview.

Source: U.S. Department of Agriculture, Science and Education Administration, Consumer Nutrition Center, 1980, USDA Nationwide Food Consumption Survey 1977-78, 48 conterminous States, spring 1977 (preliminary).

from the meat-egg group and 8 percent from the remaining food groups together.

Food eaten out provided about 18 percent of the day's iron intake for all individuals studied. These foods provided 13 percent of the iron intake for children 3 to 5, about 25 percent for adults 23 to 34, and only 10 percent for adults 65 to 74.

Among foods at home, the meat-egg and the grain groups each furnished about 29 percent of iron intake, and fruits and vegetables furnished 17 percent. Among foods eaten away, the meat-egg group contributed another 8 percent and the grain products contributed half that much (4 percent).

Sources of iron differed greatly between infants and other age groups. Infants received 98.5 percent of their iron at home. Grain products provided 46 percent; milk products, 28 percent; fruits and vegetables (including soy-based formulas), 16 percent; and the meat-egg group, 8 percent.

### Location of Eating Occasions Away From Home

Of the eating occasions (meals and snacks) reported, 77 percent were eaten at home. Another 4 percent consisted entirely of foods from home, such as bag lunches and picnics, that were eaten away from home. In 18 percent of occasions, foods were obtained and eaten away from home, and in the remaining 1 percent, foods from home and away were combined. Table 3 provides the percentage of eating occasions in which all foods were obtained and eaten away from home at various types of eating places by selected sex-age groups.

Teenagers 15 to 18 years ate about 22 percent of their meals and snacks away from home, and the largest proportion of these occasions was at school--34 percent for boys and 27 percent for girls. Fast-food places accounted for 18 percent of meals and snacks eaten out for teenage boys and 24 percent for teenage girls.

Table 3. Eating occasions away from home<sup>1</sup>

Sex and age (years)	Percent of all occasions	Percent of occasions away from home						
		Restaurant	Fast-food place	Work	School	Someone else's home	Store	Other
Children								
3-5 .....	12	4	7	0	21	54	1	13
Males								
15-18 .....	21	5	18	8	34	18	9	8
Females								
15-18 .....	23	13	24	3	27	17	6	10
Males								
23-34 .....	28	23	16	29	1	17	5	9
Females								
23-34 .....	22	19	10	27	1	28	4	11
Males								
65-74 .....	8	37	8	7	1	27	4	16
Females								
65-74 .....	8	28	1	7	0	31	1	32
All individuals .....	18	18	13	21	11	20	4	13

<sup>1</sup> Eating occasions include meals and snacks.

Source: U.S. Department of Agriculture, Science and Education Administration, Consumer Nutrition Center, USDA Nationwide Food Consumption Survey 1977-78, 48 conterminous States, spring 1977 (preliminary).

Another 17 to 18 percent of the away-from-home eating occasions were at someone else's home.

Men and women 23 to 34 years had about 28 percent of their away-from-home meals and snacks at work. People in that group ate

more often in restaurants than in fast-food places. Older men and women ate less than 10 percent of their meals and snacks away from home. They were more likely to patronize a restaurant or take a meal or snack in another person's home than to eat at a fast-food place.

## NUTRIENTS FROM MEALS AND SNACKS CONSUMED BY INDIVIDUALS<sup>1</sup>

By Eleanor M. Pao and Sharon J. Mickle<sup>2</sup>

### Meal Participation

Almost all children and older adults ate breakfast, but only about three-fourths of the teenage girls and young adults reported this meal. Over three-fourths of the individuals had lunch, plus a few others who reported the mid-day meal as dinner. More participants reported the evening meal as supper than as dinner. Over one-half of the participants had at least one snack.

Although 86 percent of the participants had breakfast on the day surveyed, percentages for various sex-age groups differed. Almost all (over 95 percent) of the children and adults 65 years and over, ate breakfast. Groups with the smallest fraction reporting breakfast were girls 15 to 18 years (77 percent) persons of both sexes 19 to 22 years (71 percent), and adults 23 to 34 years (75 to 77 percent).

Of all participants, 77 percent reported lunch. Of children 3 to 11 years, about 85 percent had lunch, but percentages were lower for

teenagers and adults and were lowest for the elderly (64 to 73 percent). Some individuals undoubtedly called the midday meal "dinner."

Nearly one-half of the survey participants had dinner. More older adults (over 50 years) than children had dinner, and only one-third of the infants had dinner. Dinner may be either a midday or evening meal, since time of eating was not a criterion in the definition of meals in this paper.

Over one-half (52 percent) of the individuals surveyed reported supper. The percentages ranged from highest for infants and children under 6 years (61 to 65 percent) to lowest for women 19 to 22 years (46 percent.)

Of the individuals surveyed, 61 percent had at least one snack (all occasions not designated as one of the four meals just discussed). Relatively more children and teenagers (59 to 70 percent) than adults (55 to 64 percent) snacked. About 40 percent of the oldest group of adults reported snacks. Among infants, 86 percent were categorized as snackers because their eating occasions, reported as feedings, were so frequent. Thus, snacks may be a misnomer for many of these eating occasions. Of the persons reporting snacks, 53 percent had only one snack, 28 percent had two, 11 percent had three, and 8 percent had four or more.

### Percentage of the Day's Nutrients

The average proportion of the day's nutrients from each of the day's meals varied from meal to meal and among sex-age groups. In general, children and the elderly apparently spread energy and nutrient intakes more evenly among their meals than other groups. Young and middle-aged adults tended to derive less of the

<sup>1</sup> Eating occasions—as named by the respondents—are classified as breakfast, lunch (includes brunch), dinner, supper, and snacks. Snacks include occasions identified as snacks and coffee or beverage breaks, as well as those designated as "other" or "not reported." The nutritive values presented for a specified meal are based on food consumed at the meal by only those individuals who reported eating that meal. Values for snacks are based on food consumed as snacks by only those individuals who reported one or more snacking occasions during the day surveyed. Therefore, the number of individuals differs for breakfast (8,291), lunch (7,409), dinner (4,703), supper (5,040), and snacks (5,859).

<sup>2</sup> Consumer Nutrition Center, Human Nutrition, Science and Education Administration, U.S. Department of Agriculture.



day's intake from breakfast than other groups and derived about half of most nutrients from dinner or supper. Intakes were generally similar for teenage girls and young women. Nutrient contributions to the day's intake differed between snacks and meals. Snacks, on the average, were the source of more of the day's carbohydrate than of other nutrients. Young children obtained a larger proportion of their day's energy and nutrients from snacks than did other groups.

At *breakfast*, adults 23 to 64 tended to consume about one-fifth of the day's energy, protein, and fat; infants, children, and the elderly consumed closer to one-fourth of the day's intake (table 1). Generally, infants, children, and the elderly averaged a higher proportion of the day's carbohydrate, minerals, and vitamins from breakfast than adults 23 to 64 especially those 35 to 50.

At *lunch*, most age groups consumed about one-third of the day's energy and nutrients, but infants and children 1 to 2 years consumed closer to one-fourth of their intakes (table 2).

At *dinner and supper*, adults under 65 years averaged between two-fifths and one-half of energy and most nutrients. Children and the elderly averaged closer to one-third to two-fifths, and infants closer to one-fifth to one-fourth (tables 3 and 4).

Occasions classified as *snacks* (nonmeals) provided 20 percent of the day's energy, 25 percent of the carbohydrate, 16 percent of the fat, and 12 percent of the protein (table 5). About 15 percent of the day's vitamins (13 to 17 percent) and iron (14 percent), but about 20 percent of the other three minerals (18 to 21 percent), came from snacks.

### Nutrient Density

Nutrient density (nutrient per 1,000 kcal) of meals and snacks indicates relationships that are useful in evaluating the quality of diets.<sup>3</sup> In general, protein and fat densities averaged lowest in snacks, and they became progressively higher in breakfasts, lunches, suppers, and dinners. Carbohydrate densities were the reverse—lowest in dinners and highest in snacks.

Usually, average calcium densities were higher for children than for adults except for snacks, but iron and magnesium densities tended to be higher for infants and adults than for children. Densities of most vitamins studied were higher for infants and children than for adults at breakfast, but, except for thiamin and riboflavin, tended to be higher for adults than for children at lunch, dinner, and supper.

For *breakfast*, protein densities averaged lower for women than for other groups. Men's breakfasts had the highest average fat densities but the lowest carbohydrate densities. Densities of calcium and iron, as well as most vitamins, averaged highest for infants and young children. Vitamin densities tended to be lowest for adults 23 to 64 years.

For *lunch*, protein densities averaged higher for adults than for children and teenagers, but carbohydrate densities were highest for infants and children and lowest for adults. Men over 64 years had lunches with the highest average fat densities. Densities of minerals and most vitamins averaged highest for infants. Although calcium density was highest in children's lunches, iron and magnesium were highest in lunches of infants and adults. Vitamin densities, except for thiamin and riboflavin, tended to be lower for children than for adults.

For *dinner and supper*, protein and fat densities averaged highest for middle-aged adults and lowest for infants and children, but carbohydrate densities were highest for infants and children and lowest for adults. Generally, calcium and phosphorus densities were higher for children than for adults, but iron and magnesium densities were higher for infants and adults than for children. Vitamin densities, except for thiamin and riboflavin, tended to average higher for adults over 50 years than for younger groups.

For *snacks*, protein densities averaged highest for infants, 1- to 2-year-olds, 9- to 14-year-old boys, and the elderly. Infants, 1- to 2-year-olds, and teenagers had snacks with the highest average fat densities, while 3- to 11-year-olds had snacks with the highest carbohydrate densities. Mineral densities, except for calcium, averaged higher for adults than for children over 2 years, and vitamin densities, except for niacin, tended to be higher for infants and the elderly and low for young and middle-aged adults.

<sup>3</sup>The data are descriptive and have not been tested for significance.



Table 1. Nutritive value of breakfast  
[Percentage of a day's<sup>1</sup> intake per individual reporting breakfast, spring 1977, 48 States, all urbanizations, all incomes]

Sex and age (years)	Individuals (number)	Individuals reporting breakfast	Food energy	Pro- tein	Fat	Carbo- hydrate	Cal- cium	Iron	Magne- sium	Phos- phorus	Vita- min A value	Thia- min	Ribo- flavin	Pre- formed niacin	Vita- min B <sub>6</sub>	Vita- min B <sub>12</sub>	Vita- min C
<b>Males and females:</b>																	
Under 1	<sup>2</sup> 78	89.6	23.2	21.3	20.3	25.7	28.1	44.2	26.7	25.8	15.8	39.7	32.5	38.7	24.8	20.6	25.6
1-2	<sup>3</sup> 264	98.8	26.7	24.2	23.3	31.2	34.4	35.4	29.7	29.3	35.1	41.0	37.6	31.2	32.5	32.1	37.5
3-5	437	95.5	24.4	22.6	21.5	27.4	35.3	31.2	28.2	28.8	38.4	37.1	37.9	27.0	32.6	34.6	36.3
6-8	469	96.5	23.2	21.0	19.6	27.4	33.6	29.2	26.8	27.2	37.8	36.7	37.5	26.9	31.9	33.3	39.6
<b>Males:</b>																	
9-11	216	92.5	21.9	19.6	18.7	26.0	33.8	27.6	25.0	26.3	38.6	37.0	37.9	26.9	31.6	32.8	36.4
12-14	313	92.2	22.5	19.4	19.1	26.9	33.4	27.0	24.9	25.6	33.7	34.6	34.7	23.7	26.0	30.8	32.9
15-18	400	86.1	20.4	18.4	18.0	24.1	29.4	24.8	24.2	23.8	32.1	31.5	31.4	21.9	25.1	28.1	32.9
19-22	287	70.6	22.4	20.9	21.8	25.8	35.4	24.1	26.5	26.2	31.0	31.6	33.1	20.1	21.5	30.8	28.8
23-34	770	74.6	19.9	18.3	18.9	23.2	28.8	22.5	24.2	22.5	26.0	28.2	27.8	19.4	18.4	25.3	28.6
35-50	784	84.0	17.9	15.4	16.3	22.0	25.6	21.0	23.3	19.0	22.2	25.2	24.0	17.5	15.4	21.2	22.9
51-64	634	91.4	19.7	16.5	17.8	23.9	26.0	23.2	25.9	20.6	23.6	27.0	25.5	20.7	18.3	22.5	26.3
65-74	295	94.9	24.1	20.3	20.5	30.5	30.3	29.7	31.6	25.7	27.7	35.3	31.3	27.0	25.0	25.3	31.6
75 and over	127	98.3	26.9	22.5	23.7	32.2	31.3	30.6	33.2	27.9	27.2	35.1	32.8	26.2	25.5	29.3	27.9
<b>Females:</b>																	
9-11	241	95.4	21.7	18.9	17.8	26.2	33.1	26.4	25.4	25.2	36.0	36.1	35.6	24.7	29.5	31.9	37.9
12-14	309	85.6	21.3	20.0	19.0	24.9	33.0	23.8	24.1	24.8	33.7	31.6	33.5	21.8	25.3	30.5	33.5
15-18	402	76.8	21.4	18.8	18.5	25.3	31.9	23.8	25.1	24.3	29.7	32.4	31.9	22.1	23.7	28.0	31.2
19-22	337	71.1	22.8	20.3	19.9	28.2	32.8	24.4	29.1	24.7	26.4	31.8	31.1	22.8	22.1	27.1	34.2
23-34	949	75.9	18.9	16.3	16.2	23.5	25.9	21.8	25.1	20.4	25.0	26.4	26.0	20.1	18.4	23.2	27.7
35-50	942	85.4	18.5	14.9	15.2	24.3	26.5	21.3	27.1	19.7	21.9	26.5	24.6	19.9	16.7	19.9	26.8
51-64	792	90.2	19.6	15.7	15.8	26.4	26.9	23.0	28.5	21.0	22.1	28.3	25.2	21.5	17.9	21.1	30.1
65-74	377	96.4	22.8	19.0	18.3	29.0	29.2	27.4	31.7	24.5	25.3	32.8	28.4	25.2	23.4	23.7	32.5
75 and over	197	97.6	25.2	20.5	20.5	31.6	30.8	29.9	33.0	25.9	26.1	35.4	30.0	27.1	24.6	24.9	34.0
All individuals	<sup>4</sup> 9,620	86.2	21.1	18.3	18.2	25.8	29.6	25.1	26.7	23.3	27.8	30.9	29.7	22.6	22.3	25.9	30.7

<sup>1</sup> Based on 24-hour dietary recall of day preceding interview.

<sup>2</sup> Excludes 36 breast-fed infants.

<sup>3</sup> Excludes 4 breast-fed infants.

<sup>4</sup> Excludes 40 breast-fed infants.

Source: U.S. Department of Agriculture, Science and Education Administration, Consumer Nutrition Center, 1980, Food and nutrient intakes of individuals in 1 day in the United States, spring 1977, USDA Nationwide Food Consumption Survey 1977-78, Preliminary Report 2, p. 96.

Table 2. Nutritive value of lunch  
[Percentage of a day's<sup>1</sup> intake per individual reporting lunch, spring 1977, 48 States, all urbanizations, all incomes]

Sex and age (years)	Individuals (number)	Individuals reporting lunch	Food energy	Pro- tein	Fat	Carbo- hydrate	Cal- cium	Iron	Magne- sium	Phos- phorus	Vita- min A value	Thia- min	Ribo- flavin	Pre- formed niacin	Vita- min B <sub>6</sub>	Vita- min B <sub>12</sub>	Vita- min C
<b>Males and females:</b>																	
Under 1	2 78	78.5	24.1	25.3	25.0	23.3	20.4	16.4	21.3	21.9	32.4	16.1	19.1	20.3	25.1	25.1	21.9
1-2	3 264	81.8	27.7	28.0	29.3	25.9	24.0	24.9	23.9	25.3	24.6	21.8	21.3	25.5	21.7	24.4	17.4
3-5	437	85.3	30.9	31.2	31.9	30.1	29.1	28.4	28.8	29.0	22.6	27.0	25.9	30.6	23.5	27.3	20.5
6-8	469	87.3	32.8	33.7	34.3	31.5	33.1	30.1	31.8	32.4	25.4	28.6	28.6	31.9	26.6	29.9	22.4
<b>Males:</b>																	
9-11	216	85.0	33.3	34.3	34.9	31.9	33.3	30.7	32.3	32.2	27.4	28.6	28.7	31.4	27.5	30.1	29.8
12-14	313	79.5	30.6	31.4	31.6	30.0	31.8	27.7	29.7	30.3	25.1	28.2	28.7	28.7	25.8	30.1	26.8
15-18	400	76.8	32.1	33.3	34.0	30.6	32.6	30.6	29.8	31.7	25.2	29.8	30.3	31.3	28.3	34.4	22.6
19-22	287	74.6	35.8	36.5	37.2	35.1	36.4	35.4	32.0	34.9	28.6	36.1	34.4	35.2	32.1	35.8	25.9
23-34	770	75.7	33.7	34.3	34.7	34.4	32.3	34.3	29.2	32.1	27.5	33.3	30.9	34.0	30.7	33.3	24.5
35-50	784	77.4	32.7	33.7	34.3	32.8	33.4	32.2	28.7	32.3	27.9	33.7	32.3	32.2	30.5	34.6	27.3
51-64	634	74.3	31.1	31.7	31.6	32.3	32.2	29.8	27.0	30.4	26.1	31.5	30.3	29.9	28.5	32.2	25.6
65-74	295	72.9	32.2	33.0	34.4	29.9	32.6	29.9	27.9	31.5	29.9	29.9	29.8	30.8	29.0	31.2	23.8
75 and over	127	64.1	31.9	33.4	34.6	28.9	33.4	29.3	26.7	32.3	31.4	27.9	29.6	30.3	28.3	34.0	25.7
<b>Females:</b>																	
9-11	241	82.7	32.2	33.7	34.3	30.3	33.7	29.4	31.2	32.1	24.0	27.8	28.9	31.7	26.0	31.8	20.9
12-14	309	81.6	32.9	32.9	34.0	33.0	33.7	32.3	31.9	33.0	26.6	31.9	31.4	32.4	28.9	33.4	26.9
15-18	402	76.0	31.3	31.8	32.7	30.4	31.2	31.1	29.5	31.1	26.7	30.4	30.1	30.3	28.4	33.3	27.1
19-22	337	74.8	35.2	36.2	37.6	33.5	35.2	34.3	30.7	34.5	29.9	33.8	33.7	33.5	31.9	37.2	28.7
23-34	949	76.7	33.1	35.1	35.5	31.5	35.7	32.5	29.0	33.8	30.6	33.0	32.5	31.7	30.5	36.1	26.3
35-50	942	76.4	32.6	34.0	34.4	31.4	33.8	31.7	28.1	32.7	29.4	32.3	32.6	31.5	30.8	35.7	24.4
51-64	792	74.5	31.0	33.3	32.3	30.2	32.1	29.8	26.7	31.4	28.2	30.2	30.6	30.3	29.8	33.4	25.0
65-74	377	70.3	33.5	35.1	36.3	30.6	32.5	31.5	28.9	32.6	30.7	30.3	31.1	32.3	30.9	31.6	25.7
75 and over	197	65.0	34.0	37.5	37.1	30.2	33.2	30.7	29.4	34.7	31.2	29.8	31.0	32.0	34.3	34.4	28.8
All individuals	4 9,620	77.0	32.3	33.5	33.9	31.4	32.7	31.0	28.9	31.9	27.6	30.8	30.5	31.3	29.0	33.0	25.0

<sup>1</sup> Based on 24-hour dietary recall of day preceding interview.

<sup>2</sup> Excludes 36 breast-fed infants.

<sup>3</sup> Excludes 4 breast-fed infants.

<sup>4</sup> Excludes 40 breast-fed infants.

Source: U.S. Department of Agriculture, Science and Education Administration, Consumer Nutrition Center, 1980, Food and nutrient intakes of individuals in 1 day in the United States, spring 1977, USDA Nationwide Food Consumption Survey 1977-78, Preliminary Report 2, p. 104.

Table 3. Nutritive value of dinner  
[Percentage of a day's<sup>1</sup> intake per individual reporting dinner, spring 1977, 48 States, all urbanizations, all incomes]

Sex and age (years)	Individuals (number)	Individuals reporting dinner	Food energy	Pro- tein	Fat	Carbo- hydrate	Cal- cium	Iron	Magne- sium	Phos- phorus	Vita- min A value	Thia- min	Ribo- flavin	Pre- formed niacin	Vita- min B <sub>6</sub>	Vita- min B <sub>12</sub>	Vita- min C
<b>Males and females:</b>																	
Under 1	<sup>2</sup> 78	34.6	24.1	27.2	25.4	22.3	23.4	18.8	23.5	24.1	33.1	18.5	22.3	21.9	25.4	25.3	21.7
1-2	<sup>3</sup> 264	42.7	31.1	37.4	35.5	25.0	24.6	29.6	29.7	30.5	33.1	24.6	25.7	34.3	33.7	30.9	26.7
3-5	437	41.8	36.9	43.7	41.1	30.7	28.6	36.9	34.8	36.3	36.1	31.3	30.8	41.6	40.7	34.7	33.5
6-8	469	45.0	36.8	42.5	41.0	30.5	26.0	36.7	34.4	34.8	33.3	29.9	28.2	39.8	38.0	33.7	30.1
<b>Males:</b>																	
9-11	216	47.2	38.6	44.0	41.6	32.4	26.0	40.8	35.4	35.7	31.9	32.1	29.6	40.2	39.9	38.4	28.2
12-14	313	47.4	39.3	45.0	43.6	32.6	28.8	39.4	37.7	38.4	38.0	30.8	30.2	40.3	42.1	34.6	35.2
15-18	400	47.4	42.3	49.5	46.4	34.5	35.3	42.4	41.0	42.3	43.9	37.4	36.9	46.3	47.4	40.0	40.5
19-22	287	46.0	42.5	47.4	46.0	38.3	35.2	45.3	42.2	41.5	49.2	40.6	38.1	47.0	48.2	41.0	45.9
23-34	770	49.3	46.2	51.9	49.3	40.2	41.2	47.8	44.3	45.7	52.2	44.1	43.7	49.0	52.5	46.5	48.2
35-50	784	49.9	47.6	54.2	51.3	41.3	39.0	50.2	43.1	47.3	54.1	45.6	44.3	50.3	55.2	48.1	52.3
51-64	634	51.9	48.0	54.5	52.0	39.7	37.8	49.2	43.5	47.8	51.6	43.0	43.2	50.6	54.7	48.9	48.4
65-74	295	51.2	45.1	50.9	48.9	38.3	34.6	43.9	40.1	43.3	46.7	37.8	38.4	46.7	48.4	43.0	42.6
75 and over	127	58.8	44.6	51.5	46.9	38.5	35.2	46.2	41.5	43.7	44.4	40.3	39.2	49.5	52.2	41.9	49.3
<b>Females:</b>																	
9-11	241	48.1	40.3	45.8	44.3	34.1	30.5	41.3	38.6	39.3	38.9	34.9	32.6	41.6	43.3	35.7	37.7
12-14	309	40.5	40.6	47.0	44.0	32.4	30.2	43.2	38.9	39.4	41.9	35.5	32.9	46.6	45.5	36.9	35.8
15-18	402	49.5	46.2	53.5	50.3	38.9	37.1	48.8	44.9	46.2	48.6	41.6	40.8	52.6	51.2	43.7	41.5
19-22	337	47.9	49.0	54.9	54.0	40.5	39.6	51.1	47.0	48.7	51.6	45.6	44.8	55.2	55.8	47.2	43.7
23-34	949	49.1	47.8	54.3	52.3	40.2	39.2	50.0	44.0	47.3	51.0	46.0	44.6	52.6	54.7	47.6	46.5
35-50	942	51.7	50.1	56.7	54.6	40.2	39.5	51.5	42.8	49.6	52.1	45.4	45.2	53.0	57.9	50.5	47.3
51-64	792	50.8	48.2	54.0	53.3	39.3	36.8	49.2	41.4	46.7	51.8	43.4	42.9	50.5	54.4	47.4	44.0
65-74	377	54.6	46.5	52.8	50.9	39.1	36.2	46.8	41.6	46.0	49.8	41.4	41.6	49.9	51.1	46.8	41.6
75 and over	197	55.7	43.7	49.7	49.1	36.2	33.4	44.4	38.8	42.5	50.7	36.1	39.4	47.0	49.5	47.0	42.8
All individuals	<sup>4</sup> 9,620	48.9	45.0	51.2	49.1	37.6	35.7	46.2	41.3	44.2	47.6	40.5	39.9	48.3	50.6	44.1	43.1

<sup>1</sup> Based on 24-hour dietary recall of day preceding interview.

<sup>2</sup> Excludes 36 breast-fed infants.

<sup>3</sup> Excludes 4 breast-fed infants.

<sup>4</sup> Excludes 40 breast-fed infants.

Source: U.S. Department of Agriculture, Science and Education Administration, Consumer Nutrition Center, 1980, Food and nutrient intakes of individuals in 1 day in the United States, spring 1977, USDA Nationwide Food Consumption Survey 1977-78, Preliminary Report 2, p. 106.



Table 4. Nutritive value of supper

[Percentage of a day's<sup>1</sup> intake per individual reporting supper, spring 1977, 48 States, all urbanizations, all incomes]

Sex and age (years)	Individuals (number)	Individuals reporting supper	Food energy	Pro- tein	Fat	Carbo- hydrate	Cal- cium	Iron	Magne- sium	Phos- phorus	Vita- min A value	Thia- min	Ribo- flavin	Pre- formed niacin	Vita- min B <sub>6</sub>	Vita- min B <sub>12</sub>	Vita- min C
<b>Males and females:</b>																	
Under 1	<sup>2</sup> 78	65.1	21.7	22.5	20.6	23.7	16.8	19.1	23.1	19.6	24.3	18.3	17.6	23.5	22.4	17.6	25.4
1-2	<sup>3</sup> 264	60.5	32.9	38.1	35.5	28.0	23.4	33.4	32.2	31.1	28.4	27.6	25.5	40.2	36.4	28.0	31.5
3-5	437	60.6	35.5	42.0	39.2	30.1	28.1	35.5	35.8	36.0	31.7	30.7	29.2	38.2	37.9	32.9	32.7
6-8	469	56.1	36.3	42.4	40.0	30.7	26.8	37.9	35.1	35.1	32.2	32.2	29.1	39.4	39.1	33.5	32.2
<b>Males:</b>																	
9-11	216	53.7	36.3	42.5	39.3	31.0	28.3	36.5	33.8	36.1	29.4	31.0	29.4	38.3	36.3	33.0	30.7
12-14	313	58.7	38.1	44.4	40.9	32.2	28.3	40.3	36.4	37.0	35.9	32.8	30.6	43.6	43.3	33.8	36.5
15-18	400	54.2	39.5	44.5	41.7	34.7	32.2	42.2	39.8	38.9	38.9	35.4	33.8	43.5	43.3	35.0	38.0
19-22	287	54.8	43.2	48.9	45.4	37.6	33.7	46.6	42.1	42.2	43.2	40.5	37.7	48.0	48.6	41.6	47.3
23-34	770	49.4	46.7	52.5	49.9	40.1	40.6	49.0	45.6	47.8	49.6	44.6	44.3	49.9	54.2	47.9	50.0
35-50	784	51.3	45.0	50.6	47.5	39.5	38.0	46.1	41.6	45.5	47.9	41.0	40.7	47.7	51.9	45.2	46.9
51-64	634	51.5	44.0	48.7	46.9	39.0	37.7	44.3	40.0	44.5	45.1	40.5	40.2	44.8	48.1	42.7	43.1
65-74	295	55.1	37.5	42.5	39.4	32.6	32.5	38.2	35.5	37.8	36.6	32.8	34.9	38.8	41.7	41.8	40.9
75 and over	127	54.2	37.5	38.4	39.2	35.1	35.1	35.2	34.0	35.6	41.3	33.7	34.4	37.6	37.3	34.6	39.6
<b>Females:</b>																	
9-11	241	54.8	35.9	42.9	38.1	30.4	26.3	37.8	33.6	35.7	32.8	30.6	29.3	39.4	38.6	33.3	30.5
12-14	309	57.2	38.9	46.1	40.9	33.2	30.8	41.9	39.2	39.6	36.0	35.8	34.1	44.1	45.6	36.6	37.1
15-18	402	50.8	44.1	50.7	47.1	38.5	37.4	46.1	42.9	44.2	41.5	40.5	39.8	49.1	48.7	42.7	39.3
19-22	337	45.7	45.3	52.4	47.1	39.3	38.9	49.6	45.2	47.0	47.5	44.0	44.1	51.1	53.8	47.7	42.4
23-34	949	47.6	46.6	52.5	50.3	40.5	40.1	48.3	44.1	47.2	48.8	45.4	43.6	49.6	54.6	46.6	46.9
35-50	942	48.5	44.1	49.4	46.6	39.2	36.4	44.5	38.8	44.3	44.8	40.7	40.1	45.8	49.5	44.1	43.9
51-64	792	51.8	44.4	49.3	48.2	37.5	37.6	44.7	39.8	44.3	46.4	39.4	41.3	45.1	49.7	45.5	40.2
65-74	377	51.7	38.0	41.7	40.4	33.7	33.5	37.6	33.1	37.7	38.8	32.3	35.2	38.9	40.6	40.0	36.7
75 and over	197	54.2	36.4	37.9	37.4	34.8	35.6	34.9	32.2	36.7	34.6	33.5	36.0	34.9	34.2	36.6	28.9
All individuals	<sup>4</sup> 9,620	52.4	41.5	47.0	44.3	36.1	34.4	42.7	39.1	41.5	41.4	37.8	37.2	44.3	46.3	40.7	40.4

<sup>1</sup> Based on 24-hour dietary recall of day preceding interview.<sup>2</sup> Excludes 36 breast-fed infants.<sup>3</sup> Excludes 4 breast-fed infants.<sup>4</sup> Excludes 40 breast-fed infants.

Source: U.S. Department of Agriculture, Science and Education Administration, Consumer Nutrition Center, 1980, Food and nutrient intakes of individuals in 1 day in the United States, spring 1977, USDA Nationwide Food Consumption Survey 1977-78, Preliminary Report 2, p. 108.



Table 5. Nutritive value of snacks<sup>1</sup>  
[Percentage of a day's<sup>2</sup> intake per individual reporting snacks, spring 1977, 48 States, all urbanizations, all incomes]

Sex and age (years)	Individuals (number)	Individuals reporting snacks	Food energy	Pro- tein	Fat	Carbo- hydrate	Cal- cium	Iron	Magne- sium	Phos- phorus	Vita- min A value	Thia- min	Ribo- flavin	Pre- formed	Vita- min B <sub>6</sub>	Vita- min B <sub>12</sub>	Vita- min C
<b>Males and females:</b>																	
Under 1 . . . . .	<sup>3</sup> 78	85.8	35.7	34.3	37.3	33.4	37.7	25.6	33.8	36.4	30.7	31.1	34.4	23.2	32.2	39.4	33.2
1-2 . . . . .	<sup>4</sup> 264	69.1	23.1	17.9	20.5	27.0	28.7	14.8	24.8	24.0	17.0	18.9	25.1	11.2	17.4	22.4	23.5
3-5 . . . . .	437	58.7	19.9	10.9	16.4	26.2	18.3	12.6	17.9	15.6	13.6	14.0	16.3	10.1	12.4	12.7	19.1
6-8 . . . . .	469	65.3	17.3	10.3	14.5	22.1	17.2	10.8	16.0	14.5	11.8	11.4	14.2	8.6	9.7	11.0	14.7
<b>Males:</b>																	
9-11 . . . . .	216	67.9	19.1	12.5	17.1	23.5	18.4	13.1	20.4	16.7	14.1	13.5	15.2	12.0	12.4	11.5	14.4
12-14 . . . . .	313	63.0	20.7	14.1	18.7	25.4	20.2	15.7	20.9	18.2	14.7	17.3	19.1	15.2	14.8	17.1	15.4
15-18 . . . . .	400	65.1	22.6	14.7	19.0	28.9	21.4	16.6	21.1	19.4	15.4	17.9	19.2	15.4	14.3	15.4	18.2
19-22 . . . . .	287	55.4	22.9	14.8	16.9	28.5	21.1	15.9	23.9	21.1	16.0	15.3	20.2	18.3	19.0	15.2	19.6
23-34 . . . . .	770	62.5	19.7	11.9	14.4	24.9	19.7	12.9	22.6	18.0	12.8	13.2	17.5	15.1	14.0	12.0	14.6
35-50 . . . . .	784	60.5	18.4	10.6	13.6	22.5	19.8	12.0	22.5	17.1	10.4	12.5	17.1	15.2	12.8	10.6	10.5
51-64 . . . . .	634	57.9	16.8	10.7	12.7	20.6	19.9	11.6	19.7	16.0	12.3	12.0	16.0	13.7	12.4	10.7	12.3
65-74 . . . . .	295	56.1	15.6	10.6	13.4	19.0	19.1	9.6	15.2	15.1	12.1	11.1	15.4	9.8	11.0	12.0	10.8
75 and over . . .	127	39.3	14.3	10.3	12.0	18.8	18.1	10.3	16.3	14.6	9.7	12.3	15.8	10.4	11.8	11.9	11.9
<b>Females:</b>																	
9-11 . . . . .	241	66.2	18.6	10.7	16.7	23.4	15.2	13.0	17.6	14.4	12.4	11.8	13.8	11.0	10.4	9.7	16.4
12-14 . . . . .	309	69.5	20.9	12.9	18.8	26.0	18.5	14.8	19.7	16.7	14.8	15.5	16.5	13.5	12.8	12.9	16.5
15-18 . . . . .	402	61.4	21.8	13.5	17.8	28.4	22.2	15.5	21.6	18.7	17.6	16.3	18.5	13.3	15.1	13.8	20.5
19-22 . . . . .	337	60.2	20.9	12.8	15.4	27.8	21.5	15.2	20.9	18.7	16.4	15.3	17.4	13.2	13.7	10.9	16.6
23-34 . . . . .	949	63.9	20.8	12.1	14.8	27.7	21.1	15.4	23.5	18.4	12.7	14.5	17.9	15.0	13.1	12.1	16.0
35-50 . . . . .	942	61.8	17.6	10.5	13.6	22.9	20.1	13.4	21.4	16.0	14.1	13.3	16.1	13.2	11.1	10.2	15.1
51-64 . . . . .	792	59.0	18.0	11.7	14.6	22.2	21.0	13.2	20.1	16.6	12.3	14.5	16.9	13.7	12.1	11.9	14.5
65-74 . . . . .	377	48.6	17.1	11.5	14.6	22.0	22.1	11.6	17.1	16.1	12.5	14.5	17.9	9.7	12.1	13.5	13.6
75 and over . . .	197	41.9	17.8	13.3	15.4	21.1	21.1	13.8	19.2	16.6	13.4	15.1	18.1	14.6	13.9	13.5	14.3
All individuals . . .	<sup>5</sup> 9,620	60.9	19.5	12.3	15.6	24.5	20.5	13.6	20.9	17.5	13.6	14.3	17.4	13.5	13.2	12.7	15.6

<sup>1</sup> Includes all occasions other than breakfast, lunch, dinner, or supper.

<sup>2</sup> Based on 24-hour dietary recall of day preceding interview.

<sup>3</sup> Excludes 36 breast-fed infants.

<sup>4</sup> Excludes 4 breast-fed infants.

<sup>5</sup> Excludes 40 breast-fed infants.

Source: U.S. Department of Agriculture, Science and Education Administration, Consumer Nutrition Center, 1980, USDA Nationwide Food Consumption Survey 1977-78, 48 conterminous States, spring 1977 (preliminary).

# HEALTH-RELATED FOOD CHOICES<sup>1</sup>

By Judy Lea Jones and Jon Weimer<sup>2</sup>

Approximately two-thirds of households interviewed in the fall of 1979 reported dietary changes for reasons of health or nutrition during the previous 3 years, according to a survey conducted by USDA's Economics and Statistics Service (ESS).<sup>3</sup> The survey was comprised of interviews in 1,353 households; the respondent was the household member identified as having major responsibility for food preparation or food shopping. Survey results also identified concerns about health-linked nutrition and confusion about reconciling health and nutrition goals with dietary practices.

Early in the interview, before the focus on health- and nutrition-related concerns were revealed, the respondent answered questions regarding the household's current frequency-of-use patterns for 37 food and beverage categories. The respondent was asked if the household had made any recent changes in the use of specific foods for reasons of health or nutrition. When describing household food pattern changes, respondents indicated the direction of specific changes and the kinds of foods selected as substitutes.

The data in the ESS survey are on self-reported dietary changes and are not consumption figures. Despite the occasional appearance of correspondence between those self-reported changes and changes in national per capita consumption of selected foods, the impact of health and nutrition concerns on consumption could not be accurately assessed. Of the households surveyed, for example, 16 percent reported that for reasons of health or nutrition they reduced their use of beef in the 3 years

prior to the survey. Coincidentally, per capita consumption of beef fell approximately 17 percent from 1976 to 1979. During that period, however, there was a drop in the beef supply and an increase in average annual retail beef prices. Obviously, price, income, and taste preference interacted in determining consumption patterns. Although concerns about health and nutrition apparently were salient, the extent of their influence on consumption was not determined.

## Food Pattern Change

Respondents were instructed to disregard, to the degree possible, concerns about price and were asked what food changes, if any, they had made for reasons of health or nutrition in the past 3 years. These responses were summarized (see table).

Fat and cholesterol. Roughly 15 to 20 percent of the respondents reported that for reasons of health or nutrition they had reduced their use of bacon or sausage, hot dogs or luncheon meats, eggs, beef, and fresh pork during the past 3 years; conversely, similar proportions reported increased use of poultry and fish or shellfish. Of the 11 percent of the households that changed the type or combination of types of milk used, 92 percent substituted a low-fat milk for milk with higher fat content.

Respondents in 1 of 10 households reported reduced use of butter and other fats and oils; a somewhat smaller proportion increased use of margarine, indicating some substitution of margarine for butter. The net percentages do suggest that some consumers are intent upon reducing overall use of fats and oils. Finally, roughly 1 in 10 households reported a recent change in the type of margarine or other fats and oils used; the direction of change was toward the use of soft margarines and vegetable oils.

Complex carbohydrates. Of the respondents, 25 percent reported increased use of fruits and vegetables. One in 7 households substituted whole-grain bread for white bread and 1 in 10

<sup>1</sup>This article is condensed from a paper presented at the Agricultural Outlook Conference in November 1980 at Washington, D.C. Complete copies are available from National Economics Division, Economics and Statistics Service, Room 260, 500 12th Street, SW., Washington, D.C. 20250.

<sup>2</sup>National Economics Division, Economics and Statistics Service, U.S. Department of Agriculture.

<sup>3</sup>Survey conducted before the Dietary Guidelines were published by the U.S. Department of Agriculture. See "USDA/HEW release joint dietary guidelines," *Family Economics Review* Spring 1980, p. 36.

# Consumer perception of recent changes in household food-choice patterns

Food	Never used	No change	Change	Type of change <sup>1</sup>			
				Stopped	Decreased	Increased	Used different type
				Percent			
Bacon, sausage . . . . .	4	71	25	4	21	*	*
Hot dogs, luncheon meats . . . .	7	73	20	3	16	*	2
Eggs . . . . .	1	79	20	1	16	3	*
Beef . . . . .	*	80	20	1	16	2	1
Fresh pork . . . . .	8	75	17	3	14	*	*
Poultry . . . . .	1	81	18	*	1	17	*
Fish . . . . .	7	78	15	*	*	15	*
Shellfish . . . . .	28	67	5	*	1	4	*
Milk . . . . .	*	82	18	*	4	5	<sup>2</sup> 11
Cheese . . . . .	2	84	14	*	5	8	2
Butter . . . . .	30	61	9	3	5	1	*
Margarine . . . . .	6	81	13	1	3	6	5
Other fats and oils <sup>3</sup> . . . . .	1	81	18	*	11	*	<sup>4</sup> 8
Fruits and vegetables . . . . .	*	74	26	*	1	25	2
Bread . . . . .	*	77	23	*	10	1	<sup>5</sup> 14
Cereals, grains . . . . .	1	82	17	*	4	4	<sup>6</sup> 10
Refined sugar and sugary foods <sup>7</sup> . . . . .	1	69	30	1	29	*	*
Soft drinks . . . . .	8	72	20	1	14	*	<sup>8</sup> 7
Salty foods and snacks <sup>9</sup> . . . . .	5	73	22	1	21	*	1

<sup>1</sup> Percentages may add to more than 100 because change may include using more or less and a different kind.

<sup>2</sup> 92 percent of these households report substitution of a low-fat milk for one higher in fat; other substitutions include mother's milk, unpasteurized milk, acidophilus milk, and whole milk.

<sup>3</sup> Other fats and oils include lard, vegetable shortening, and liquid oils.

<sup>4</sup> 75 percent of those households using a different type or combination of types of other fats and oils report substitution of corn, safflower, and sunflower oil for unspecified vegetable oils; 55 percent report substitution of liquid oils for solid fat (lard or shortening).

<sup>5</sup> 87 percent of those households using a different type or combination of types of bread report substitution of whole-grain bread for white bread; other substitutions include homemade bread, diet bread, high-fiber bread, and preservative-free bread.

<sup>6</sup> 69 percent of those households using a different type or combination of types of cereal report substitution of unsweetened cereal for sweetened cereal; other substitutions include high-fiber cereal (19 percent), whole-grain cereal (18 percent), hot cereal (9 percent), fortified cereal (5 percent).

<sup>7</sup> Refined sugar and sugary foods, such as candy, sweet desserts, and sweet baked goods.

<sup>8</sup> 87 percent of these households report substitution of diet soft drinks for regular soft drinks; 11 percent report substitution of regular soft drinks for diet soft drinks.

<sup>9</sup> Salty foods such as nuts, olives, pretzels, chips, and other salty snacks.

\*Less than 0.5 percent.



households reduced use of bread. Roughly 7 percent of the households shifted from high-sugar cereals to those with less sugar.

**Salt.** For reasons of health or nutrition 22 percent of sample households reduced the use of salty foods and snacks.

**Sugar.** Three in 10 households reduced use of sugar and sugary foods such as candy, sweet desserts, and sweet baked goods; many of these households increased their use of fruit and specifically mentioned substituting fruit for "sweets." One in seven households reduced use of soft drinks.

### **Health, Nutrition, and Safety Concerns**

Of the sample households, 64 percent reported that they made dietary changes for reasons of health or nutrition in the 3 years prior to the survey. A variety of specific health or nutrition concerns were cited as reasons for those changes.

**Concern about excess sugar.** More than half (52 percent) of the households making diet changes for reasons of health or nutrition mentioned reducing sugar intake. This concern was more prominent among high-income groups and those with more schooling. Larger households and those with children also were more likely than others to mention concern about sugar. Households concerned about excess sugar were more likely than households not concerned to report decreased use of regular soft drinks, sweet baked goods, sweetened cereals, and candy with increased use of diet soft drinks and unsweetened cereals.

**Concern about calorie intake or weight control.** About 43 percent of the households that made dietary changes cited weight control as the primary reason for at least one change. Weight control was the leading reason given for decreasing use of beef, bacon or sausage, hot dogs or luncheon meats, whole milk, white bread, and cereals and grains. It was also the primary reason given for increasing use of poultry, cream substitutes, and artificially sweetened foods and for substituting diet for regular soft drinks. People in high-income households were more likely than others to limit dietary intake to control weight. Not all households in which someone had

limited intake, however, reported consequent changes in food use.

**Concern about salt intake or blood pressure control.** In about 29 percent of the households making dietary changes, respondents mentioned concern about reducing salt intake or controlling blood pressure. These related concerns were the reasons cited most often for reducing household use of pork, shellfish, and snack foods, such as potato chips, pretzels, nuts, and olives. The incidence of concern about salt intake and blood pressure control was positively associated with the age of the respondent and was high among blacks.

Surprisingly, the frequency-of-use patterns of households concerned about salt intake or blood pressure control did not differ significantly from those of households not expressing concern about salt or blood pressure control with respect to such foods as bacon and sausage, salted nuts, and commercially prepared dinners and main dishes. Households concerned about controlling blood pressure were more likely than others to preclude the use of fresh pork, even though uncured pork contains about the same level of natural sodium as beef, poultry, and fish.

**Concern about fat intake.** About 28 percent of the households making dietary changes wanted to reduce fat intake. Concern about fat intake was the chief reason given for shifting to lean beef and lean poultry and for substituting low-fat milk for milk with higher fat content. Respondents with high levels of education were more likely than others to mention concern about fat intake.

**Concern about cholesterol intake.** About 23 percent of the households making dietary changes were concerned about cholesterol. Lowering the cholesterol intake was the primary reason cited for reducing use of eggs, cheese, and butter and for substituting margarine for butter. Concern about cholesterol intake was more prominent among groups with high education and high income than among others.

**Concern about food safety.** Of those households that made at least one dietary change for reasons of health or nutrition within the past 3 years, 12 percent specifically mentioned reduction of nitrite intake; 5 percent men-



tioned reduction of saccharin intake. Ten percent said that they had made a change in food use in order to reduce intakes of preservatives, colorings, or other (nonspecified) additives.

In an earlier study conducted in 1974<sup>4</sup> respondents were asked to give their perception of the relative safety of a number of ingredients that might be present in food. A similar question appeared in the 1980 survey. The proportion of respondents who considered either nitrite or saccharin safe had dropped significantly in the period between these two surveys. Only 19 percent of the respondents in 1980 thought that nitrite was somewhat or very safe (as opposed to 35 percent in 1974), and 30 percent thought that saccharin was somewhat or very safe (as opposed to 59 percent in 1974). Respondents' perceptions of the relative safety of those additives were consonant with the frequencies-of-use of selected products that they reported for their respective households. For example, in the households of those respondents who perceived nitrite as either "not too safe" or "not at all safe," such foods as bacon and sausage, luncheon meats and hot dogs, and commercially prepared foods were used less frequently than they were in households where the respondent perceived nitrite as safe. Similarly, in the households of respondents who perceived saccharin as either "not too safe" or "not at all safe," diet soft drinks and artificial sweeteners were used less frequently than in households where the respondent perceived saccharin as safe.

### Influential Information Sources<sup>5</sup>

Respondents from households that had made recent dietary changes for reasons of

health or nutrition were asked what source(s) of information, if any, influenced household members to make a change. More than half (56 percent) of those respondents cited the health profession—doctors, dentists, and nurses; the elderly and those with low educational levels were more likely than others to cite health professionals as the most influential source of information. Because of this substantial influence, training in nutrition for physicians and other health professionals should have high priority, and nutritional training and services should be promoted in hospitals and clinics.

The professional group consisting of dietitians and nutritionists, who are trained in the nutritive aspects of food, was cited as an influential source of information by 13 percent of the respondents in households making diet changes. Eight percent reported that government publications or pamphlets influenced household dietary changes; 4 percent referred to other sources, such as an extension worker or public health educator.

Magazines, newspapers, and television were each cited as an influential source of information by about one-third of the respondents in households where food practices were changed for reasons of health or nutrition; respondents from households with high income and high education were more likely than others to cite those sources. Food and nutrition messages presented in the mass media and in food advertising are powerful influences on food choices. The evidence suggests that structured campaigns for distribution of information about nutrition through multiple media could positively influence food selections.

The survey indicated that people are concerned about diet and its relation to health and that they need information or guidance to help clear up some misconceptions. The fact that, to a large extent, they relied on health professionals and the media for dietary guidance suggests that the quality of information available from these sources should be given high priority.

<sup>4</sup> Jones, Judith Lea, and Jon P. Weimer, 1977, *Food Safety: Homemakers' Attitudes and Practices*, Agricultural Economic Report No. 360, U.S. Department of Agriculture, Economic Research Service.

<sup>5</sup> U.S. Department of Agriculture, Economics and Statistics Service, National Economics Division, 1981, Nutrition information—Perspective on consumers' views, *National Food Review*, NFR-14.

# TIME USE AND FAMILY LIFE<sup>1</sup>

By Karen P. Goebel<sup>2</sup>

The conventional wisdom is that the lifestyles of American families have changed substantially during the past two decades. The changes in lifestyles reflect increased participation of women in the labor force, increased diversity in family structures, decline in number of children per family, and increased orientation toward self. These changes in lifestyle have commanded the attention of social scientists who are attempting to explain why these lifestyles have evolved and to predict future trends. An indicator of changing family lifestyles that has received substantial attention is the pattern of family time use.

Our affluent society has made available alternative uses of time. Certain household production activities, however, continue to demand time. Food preparation and cleanup, clothing care, care of family members, management, shopping, and maintenance of home and family possessions are indispensable to the functioning of families and society. One source of family stress is the conflict between "necessary" household work and alternative uses of time. This paper briefly reviews studies of the changes in the patterns of family time use with emphasis on changes in household work time. The major studies through the early 1970's are reviewed. The methodology and preliminary findings are reported for a multi-State family time-use study, An Interstate Urban/Rural Comparison of Families' Time Use, U.S. Department of Agriculture, Northeast Regional Project 113 (NE113). Implications of these studies for future educational programs and research efforts are also presented.

## Why Measure Family Time-Use Patterns?

One area of interest in the evolving patterns of time use is the attempt to "value" the non-market home production activities. Lawyers

and insurance companies have become well aware of the need for accurate valuing of inputs to the maintenance of home and family as they seek to estimate monetary loss to families when a homemaker is incapacitated or killed.

For the estimation of monetary value of any homemaking activity, the time used and the "price" of that time must be known. Although the method of pricing different household activities has been somewhat debatable, the time component must be measured accurately. Thus, accurate time-use estimates provide a strong foundation for alternate methods of determining monetary value.

Studies of family time use generate standards with which families can compare their own activities. These standards need not be considered desirable goals, but they are an aid for individual families in managing their time. They also might enhance the appreciation of family members for the current pattern of distribution of work within the family and provide a basis for examining the equity of the pattern. This examination does not guarantee that families will improve the distribution of work, but it will provide a sensitivity to current inequities.

National productivity measures based solely on the market sector are deficient in regard to nonmarket productivity. Therefore, improved understanding of the extent of nonmarket production activities is important. Family time-use studies do not entirely fill the gap in knowledge about nonmarket production, but they begin to provide a sound knowledge base for determining the importance of household production activities.

## Family Time-Use Studies Since 1920

The recognition of time as a valuable resource and the measurement of time-use patterns have a long history. This section concentrates on studies in the United States after 1920 that are grounded in home economics research. Ortiz (6) briefly reviewed publications from other social science disciplines.

In the twenties, the U.S. Bureau of Home Economics developed guidelines for the study of women's time use. The studies that used these guidelines concentrated primarily on

<sup>1</sup> This article is condensed from a paper presented at the Agricultural Outlook Conference in November 1980 at Washington, D.C. Complete copies are available from the Family Economics Research Group (see p. 2 for address).

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farm women. Fortunately, farmwork was separated from homework, permitting later comparisons with urban households. Wilson (15) in 1929 reported that Oregon farm wives averaged 53.5 hours per week in household work. Data from Wilson's study and two other early studies were compared with data collected in 1953 in Wisconsin by Cowles and Dietz (1). Wisconsin homemakers spent 53 hours per week in household work. Total homemaking time had remained remarkably constant in spite of rapid technological changes. That observation was confirmed by Vanek (12), who reviewed 20 time-use studies that extended from the twenties to the sixties. Vanek found no difference between urban and rural women. Women who were not employed outside the home spent 52 hours per week in housework in 1924 and 55 hours in the sixties. Employed women spent 26 hours per week in housework in the sixties. Vanek attempted to explain the 29-hour difference per week between employed and unemployed women by differences in family characteristics, purchased household services, and help from family members. She found no support in the data of the sixties for explanations based on these factors. Vanek concluded (12, p. 120), "It appears that modern life has not shortened the women's work day. Farmwork has been greatly reduced, but it has been replaced by work in the labor force. Indeed, for married women in full-time jobs the work day is probably longer than it was for their grandmothers."

The 1967 time-use study of New York households, directed by Kathryn E. Walker of Cornell University, has become a classic study of family time use and its role in household production (Walker and Woods 14). In a preliminary report, Walker (13) summarized findings regarding time-use patterns for household work and homemakers' employment at the 1970 National Agricultural Outlook Conference. The average time contributed by husbands in household work was 11 hours per week and 51 hours for wives. Walker found that if the homemaker was employed 30 hours or more per week, approximately 5 hours per day were spent in household work, as compared with 8 hours per day for full-time homemakers. In contrast, the husband's time remained the same, on the average, whether the homemaker was not employed, employed part time, or

employed 30 hours or more per week. Based on the 1967 results, Walker (13) recommended that future time-use studies consider four important variables: Number of children, age of the youngest child, employment of wives, and husband's hours of paid employment.

#### **Interstate Urban/Rural Comparison of Families' Time Use**

On the basis of previous studies, Walker and researchers in 11 States concluded that a more comprehensive effort was needed. California, Connecticut, North Carolina, Virginia, Wisconsin, Oklahoma, Oregon, Texas, Louisiana, and Utah joined New York to form the NE 113 Project: Interstate Urban-Rural Comparison of Families' Time Use.

By use of the recommendations of the 1967 New York study, relatively small samples of rural and urban families were randomly chosen in each State. The samples were controlled for family size (two-parent, two-child) and represented families in which the youngest child was under 1, or was 1, 2 to 5, 6 to 11, or 12 to 17 years of age. This control of number and age of children as important variables permitted comparison across States. Standardized procedures were developed so that day of the week and time of the year could be equally represented in the sample. In each State, 105 urban and 105 rural families were interviewed by standardized recall and diary procedures. Time was recorded in 5- to 10-minute blocks for all family members over 6 years of age. Data were collected during the 1977-78 time period.

Space limitations do not permit an indepth discussion of findings from all States. A limited discussion is presented of raw time-use patterns in housework and paid work across four States: New York, Wisconsin, Utah, and Oregon. Included is Sanik's work (10, 11) in testing differences in rural and urban residence, geographic location, and a decade comparison with the original New York study.

Minutes per day spent by all family members in household work and paid work are shown in table 1. Average time spent in all household work by all family members was highest in New York at 678 minutes per day, and lowest in Utah at 569 minutes. Within household tasks, raw scores differed markedly among the four States in nonphysical care of family

members, shopping, house cleaning, and household maintenance. In paid work time, Wisconsin led with 570 minutes per day, and New York was the lowest with 482 minutes.

Details on homemaker and spouse contributions are provided in table 2. Homemakers averaged 397 minutes (for all household work) in Utah, 59 minutes lower than in New York. Total household work by spouses averaged 145 minutes in New York and 38 minutes less in Utah. Differences among homemakers were greatest in housecleaning, nonphysical care, and shopping. Differences among spouses were greatest in maintenance of car, house, and pets; nonphysical care; and shopping time. In paid work, Wisconsin homemakers led with 117 minutes per day, 50 minutes higher than Oregon homemakers. Wisconsin spouses also led in paid work with 415 minutes per day, 21 minutes higher than Oregon spouses.

These comparisons of raw scores provide only limited insight into family time-use patterns. Sanik (11) has completed the most detailed analysis to date of current time-use patterns in New York and Oregon. She found that a significant amount of variance in all household work by all family members was associated with State of residence. New York families spent 11.3 hours per day, and Oregon families spent 10.4 hours per day in all house-

hold work. New York homemakers spent 7.7 hours, and Oregon homemakers spent 6.8 hours per day in all household work.

Sanik also compared urban New York family time-use patterns for 1967 and 1977, using Walker's 1967 time-use study and the NE113 data for New York. Over the decade there was no significant change in all household work by all family members. For spouses, however, nonphysical care of family members increased significantly, as did contributions to all household work.

Recently, Sanik (1980) completed a new analysis, using the data from the two time-use studies (table 3). The more recent results, which weight the data to conform with the population, represent changes in two-parent, two-child households over the decade. Overall, she found that adjusted total family time in all household work decreased slightly. Sanik's results indicate that although homemakers' time decreased, it continued to account for nearly 70 percent of total family time in household work; spouses' time accounted for slightly over 17 percent. These findings are consistent with those of previous studies and indicate that distribution of tasks between spouses has not changed markedly.

Scientists in the States affiliated with the NE113 project have begun analyses of their

Table 1. Comparison of total family time-use patterns in household and paid work in selected States (1977-78)

Task	New York	Wisconsin	Utah	Oregon	Maximum difference
<i>Minutes per day</i>					
Food preparation	<sup>1</sup> 105	89	93	97	16
Dishwashing	<sup>1</sup> 45	44	38	36	9
House cleaning	76	54	<sup>1</sup> 93	68	39
Maintenance	96	80	92	<sup>1</sup> 112	32
Clothing care	<sup>1</sup> 40	36	25	28	15
Clothing construction	<sup>1</sup> 21	16	17	19	5
Physical care	72	65	70	<sup>1</sup> 73	8
Nonphysical care	92	<sup>1</sup> 100	53	64	47
Shopping	105	88	63	<sup>1</sup> 106	43
Management	26	<sup>1</sup> 39	29	33	13
All household work	<sup>1</sup> 678	611	569	636	109
Paid work	482	<sup>1</sup> 570	553	495	88

<sup>1</sup>Greatest time use within category.

Source: U.S. Department of Agriculture, Northeast Regional Project 113, An interstate urban/rural comparison of families' time use (unpublished base data books).



time-use data. Studies of meal preparation and food purchases away from home have been completed in Wisconsin and Utah (2, 6, and 8). Goebel et. al. (3) and McCullough (4) studied the relationship between the structuring of the household division of labor and subjective satisfaction with the quality of life. Children's contributions to household work were studied in New York (5), Utah (7), and Louisiana.<sup>3</sup>

<sup>3</sup> Personal correspondence with Fran Cogle, associate professor, School of Home Economics, Louisiana State University, Baton Rouge.

## Conclusions and Implications

Women continue to provide the largest proportion of household work time, and total family time devoted to household work apparently is not changing significantly for two-parent families with young children. In general, the husband's total contribution to household work apparently has not increased significantly for these families.

The studies to date have several implications. Conclusions will differ among time-use studies depending on definitions of the sampling objective. These differences might be attributed primarily to NE113's examination of a single

Table 2. Comparison of homemaker(H)/spouse(S) time-use patterns in household tasks and paid work in selected States (1977-78)

Task		New York	Wisconsin	Utah	Oregon	Maximum difference
<i>Minutes per day</i>						
Food preparation . . . . .	H	<sup>1</sup> 83	72	79	78	11
	S	8	<sup>1</sup> 10	7	7	3
Dishwashing . . . . .	H	<sup>1</sup> 38	36	31	29	9
	S	3	<sup>1</sup> 4	2	3	2
House cleaning . . . . .	H	62	43	<sup>1</sup> 78	54	35
	S	3	<sup>1</sup> 4	3	2	2
Maintenance . . . . .	H	24	28	29	<sup>1</sup> 37	13
	S	<sup>1</sup> 56	37	47	55	19
Clothing care . . . . .	H	<sup>1</sup> 37	<sup>1</sup> 32	24	25	13
	S	1	2	0	1	2
Clothing construction . . . . .	H	<sup>1</sup> 20	15	16	18	5
	S	0	0	0	0	0
Physical care . . . . .	H	<sup>1</sup> 63	55	58	61	8
	S	9	9	<sup>1</sup> 10	9	1
Nonphysical care . . . . .	H	60	<sup>1</sup> 66	34	39	32
	S	<sup>1</sup> 31	30	14	21	17
Shopping . . . . .	H	<sup>1</sup> 55	47	37	54	18
	S	24	19	13	<sup>1</sup> 27	14
Management . . . . .	H	16	<sup>1</sup> 23	15	19	8
	S	10	<sup>1</sup> 13	11	11	3
All household work . . . . .	H	<sup>1</sup> 456	416	397	414	59
	S	<sup>1</sup> 145	127	107	136	38
Paid work . . . . .	H	77	<sup>1</sup> 117	82	67	50
	S	395	<sup>1</sup> 415	412	394	21

<sup>1</sup> Greatest time use within category.

Source: U.S. Department of Agriculture, Northeast Regional Project 113, An interstate urban/rural comparison of families' time use (unpublished base data books).

Table 3. Adjusted mean time spent in household work by family member (New York 1977; 1967)

Task	Homemaker		Spouse		Total family <sup>1</sup>	
	1977	1967	1977	1967	1977	1967
<i>Hours per day</i>						
Food preparation . . . . .	1.4	1.5	.1	.1	1.6	1.6
Dishwashing . . . . .	.6	<sup>2</sup> .8	.05	.04	.8	<sup>2</sup> .9
House care . . . . .	1.5	1.5	.7	.7	2.7	2.6
Clothing care . . . . .	.9	<sup>2</sup> 1.3	( <sup>3</sup> )	( <sup>3</sup> )	.9	<sup>2</sup> 1.3
Shopping . . . . .	.9	.8	.3	.3	1.7	<sup>2</sup> 1.2
Management . . . . .	.3	.2	.1	.2	.4	.4
Care of family members . . . . .						
Physical . . . . .	.6	<sup>2</sup> .7	.1	.1	.7	.8
Nonphysical . . . . .	.7	.6	.3	.3	1.0	1.2
Total <sup>4</sup> . . . . .	6.8	<sup>2</sup> 7.4	1.7	1.7	9.8	10.0

<sup>1</sup> Includes children.<sup>2</sup> Significantly different—0.05.<sup>3</sup> Less than 0.05 hour.<sup>4</sup> Totals may not add up due to rounding when connecting minutes to hours.

Source: Sanik, Margaret M., 1980, Familial division of household work: A decade comparison (unpublished working paper).

family structure. In other national time-use studies (9), random samples included household structures other than two-parent families with young children. As families become increasingly diverse in structure, time use for alternative structures should be examined. Professionals in family economics and management should give increasing attention to the many potential problems in family functioning which are created when time-use alternatives interact with a fairly stable requirement for household labor. Family management spe-

cialists should reemphasize effective time management techniques and creatively explore new time-use strategies.

Family economists should examine the extent to which the possessions and the consumption patterns of our affluent society have actually increased household work. Energy scarcity and inflation have led to several proposals which imply increased home production. Time-use studies suggest that any increase in the level of production in the home would fall disproportionately on the shoulders of women.

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## NEW INITIATIVES IN HOME ECONOMICS

In 1977, Congress called for new initiatives to improve and expand research and extension programs in home economics, human nutrition, and family living. In response to this congressional mandate, the Science and Education Administration of the USDA, in cooperation with representatives from the land-grant college and university system, other institutions, professional groups, and user organizations, developed a plan for strengthened national effort in home economics. This plan, "New Initiatives in Home Economics," provides a framework for directing program effort to high-priority problems. It focuses on population groups most in need of service and presents recommendations on strengthening organizational arrangements to improve coordination, cooperation, and integration of activity among research, extension, and higher education. The initiatives proposed in the report are organized under four thrusts: Family economic stability and security; energy

and environment; food, nutrition, and health; and family strengths and social environment.

Two publications are available for persons interested in more information on the "New Initiatives":

- Miscellaneous Publication No. 1401, "Highlights of A Comprehensive National Plan for New Initiatives in Home Economics Research, Extension and Higher Education," is a highlights and summary brochure for popular or non-technical use. This small leaflet is suitable for handouts.
- Miscellaneous Publication No. 1405, "A Comprehensive National Plan for New Initiatives in Home Research, Extension and Higher Education," is intended for use in program planning.

Single copies of both publications are available free from Science and Education Administration, Information Staff, Room 6009, South Building, Washington, D.C. 20250.



# HOUSEHOLD ENERGY USE AND CONSERVATION<sup>1</sup>

By Carol B. Meeks<sup>2</sup>

## ENERGY CHARACTERISTICS OF HOUSING

### Structural Characteristics

Owner-occupied, detached, single-family housing units are the highest energy users because of exterior surface areas exposed, air infiltration, and internal load density (energy requirements resulting from lights, appliances, and occupants). Such units are the dominant type of nonmetropolitan housing.

Home heating or cooling is the highest energy user for most households, and size of the housing unit is a major factor in energy use. Today, larger housing units dominate new construction. Over 50 percent of all new 1979 U.S. housing units had floor areas of 1,600 square feet or more, with little regional variation. This housing, however, accounted for 41 percent of new nonmetropolitan units and 60 percent of new metropolitan units.

In housing, conservation devices, such as storm doors and windows and insulation, have been traditional. Investments in these items were less cost-beneficial in earlier periods of low-cost fuels than they are today. According to the 1977 Annual Housing Survey,<sup>3</sup> owner-occupied homes in nonmetropolitan areas were somewhat more likely to have one or more storm doors or windows than were homes in metropolitan areas. Owner-occupied homes in metropolitan areas, however, were slightly more likely to have attic or roof insulation. Owner-occupied homes in nonmetropolitan areas were more likely to have received increased weather protection in 1977 than were

homes in metropolitan areas; the only exception was that metropolitan homes were slightly more likely to have received weatherstripping than were nonmetropolitan homes.

Although often criticized as a cause of heat loss, fireplaces have increased in popularity; in 1979, 67 percent of all new housing units had at least one fireplace. New housing units in the West and South were more likely to have fireplaces than those in the Northeastern or North Central regions, and new nonmetropolitan houses were less likely to have fireplaces than were new metropolitan homes.

### Systems and Equipment

The type of fuel used in home heating varies by metropolitan-nonmetropolitan location. In 1979, both metropolitan and nonmetropolitan housing units were most likely to be heated with utility gas. However, 61 percent of metropolitan units, as compared with only 43 percent of nonmetropolitan units, were heated with utility gas. More nonmetropolitan units than metropolitan units were heated with electricity, bottled gas, coal, or wood. Distribution of fuels used in home heating has changed somewhat since 1970. The use of electricity has increased in both metropolitan and nonmetropolitan locations, while the use of fuel oil has declined.

Electricity was the most popular type of heating fuel used in new housing units in 1979. Of new housing, 61 percent was heated by electricity in nonmetropolitan areas, compared with 46 percent in metropolitan areas. There was great variation according to region in the use of electricity in new housing—68 percent in the South, 33 percent in the North Central region, 35 percent in the Northeastern region, and 46 percent in Western region. Over 25 percent of all new units in 1978 and 1979 had electric heat pumps (data on heat pumps were not collected prior to 1978). Although heat pumps may be part of the energy solution, maintenance costs may outweigh energy cost savings over the long run.

In the last 5 years, new, single-family housing units completed with central air-conditioning increased from 46 to 60 percent. In 1979, 85 percent of all new housing units in

<sup>1</sup>This article is condensed from a paper presented at the Agricultural Outlook Conference in November 1980 at Washington, D.C. Complete copies are available from the Family Economics Research Group (see p. 2 for address).

<sup>2</sup>Housing program leader, Economic Development Division, Economics and Statistics Service, U.S. Department of Agriculture. Special thanks to John Hession and Ron Kampe, Economic Development Division, for providing background material and to James Mikesell for his helpful comments. The views expressed here are those of the author.

<sup>3</sup>U.S. Department of Commerce, Bureau of the Census, 1979, General housing characteristics for the United States and regions: 1977, *Annual Housing Survey: 1977, Part A*, Current Housing Reports, Series H-150-77.

the South had air-conditioning; whereas, only 26 percent of new units in the Northeast had air-conditioning. New nonmetropolitan housing units are less likely to have central air-conditioning than are metropolitan units.

Expansion in the use of home appliances has somewhat increased energy use. From 1970 to 1979, the number of homes with room air-conditioners, dishwashers, clothes dryers, home freezers, and color television sets increased by 60 percent or more.

### ENERGY PRICES, QUANTITIES, AND EXPENDITURES

Average residential energy prices in dollars per million Btu's vary by fuel type; electricity currently is the most costly and natural gas the least costly (table 1). From April 1978 to March 1979, rural households paid lower prices

than urban households for individual fuel types per million Btu's but paid more per million Btu's overall due to their greater use of electricity. Regional variation is considerable in average amount of energy consumed and average expenditures per household (table 2). Households in the North Central region consumed an average of 180 million Btu's from April 1978 to March 1979, with an average expenditure of \$821. Northeastern households consumed an average of 166 million Btu's for an average expenditure of \$887. Southern households consumed the least energy, but western households had the lowest average expenditures.

A comparison of data collected by the Department of Energy (DOE) with data collected by the Rural Electric Administration (REA) on average electric bills indicates that areas ser-

Table 1. Average energy prices in dollar/million Btu's (April 1978-March 1979)

Area	All	Electric	LP gas	Fuel oil or kerosene	Natural gas
United States . . . . .	5.25	12.10	5.09	3.93	2.74
Northeast . . . . .	5.33	15.34	7.93	3.98	3.42
North Central . . . . .	4.57	13.64	4.55	3.82	2.57
South . . . . .	6.81	11.75	5.16	3.94	2.85
West . . . . .	4.27	8.28	4.18	3.77	2.30
Urban . . . . .	5.06	12.95	5.87	3.96	2.76
Rural . . . . .	5.85	10.50	4.91	3.88	2.60
SMSA . . . . .	5.16	13.01	5.69	3.97	2.78
Non-SMSA . . . . .	5.46	10.71	4.79	3.86	2.64

Source: U.S. Department of Energy, 1980, *Consumption and Expenditures, April 1978 through March 1979*.

Table 2. Average energy consumption and expenditures for all fuels per household (April 1978-March 1979)

Area	Million Btu's	Dollars
United States . . . . .	138	724
Northeast . . . . .	166	887
North Central . . . . .	180	821
South . . . . .	99	674
West . . . . .	110	469
Urban . . . . .	141	716
Rural . . . . .	128	748
SMSA . . . . .	142	734
Non-SMSA . . . . .	129	704

Source: U.S. Department of Energy, 1980, *Consumption and Expenditures, April 1978 through March 1979*.



viced by REA typically had higher average costs for all kilowatt-hours of usage.

As measured by the Consumer Price Index, price increases from 1970 to 1980 were 127 percent for electricity, 221 percent for natural gas, and 421 percent for oil. These increases are important to consumers in their choices of fuel and equipment for their homes.

## CONSERVATION INCENTIVES

### Prices

A study of 90 natural gas (NG) users and 129 liquid petroleum gas (LPG) users in rural Indiana indicates the response of households to price increases.<sup>4</sup> In 1971 the price of LPG was twice that of NG, and in 1973-74 the price of LPG doubled, whereas NG changed only slightly. LPG households increased their fuel-use efficiency in 1973-74 and maintained and improved the increase in the following years, while NG users made only slight changes. LPG users had more insulation than NG users, and more often adopted and maintained energy conservation activities, such as closing off a room and turning down the thermostat. Structural changes—attic and wall insulation, adding storm doors or windows, caulking, and weatherstripping—were reported by more LPG households than NG households. The study concludes that a substantial economic incentive is required to create a significant and sustained energy conservation response.

### Tax Credits

One Federal approach to inducing conservation is through tax credits or deductions. The Federal personal income tax credit permits deduction of 15 percent of the first \$2,000 expended on qualified items. A recently completed survey of expenditures for conservation and renewable resource measures that were reported on 1978 Individual Tax Return (1040) forms gives information on residential conservation activities.<sup>5</sup> Tax credit expendi-

<sup>4</sup> Ogus, Margo Rich, 1980, Residential energy conservation and price response, doctoral dissertation, Food Research Institute, Stanford University, Stanford, Calif.

<sup>5</sup> U.S. Department of Treasury, 1980, 1978 Individual Income Tax Returns, Preliminary Report, Pub. No. 198 table 4.

tures were reported on 5.9 million returns, representing 6.6 percent of the total number of 1978 individual tax returns. A total of \$4.2 billion, or an average of \$708 per return reporting the expenditure, was reported to the Internal Revenue Service as expended for these purposes. In general, conservation activity was greatest in the Northeastern, North Central, and West Central regions and least in the Southern and Western regions.

The low usage of tax credits could indicate that the 15-percent credit is an ineffective incentive. Many low-income households probably do not have the capital for investments in energy-saving items. In addition, the long tax form must be completed to claim the deduction. Expenditures for caulking, weatherstripping, and so forth, are relatively small, and a minimum \$10 tax credit (\$67 actual cost) is allowed. (Small expenditures, however, can be accumulated over several years and claimed when the total is great enough.) Furthermore, the improvements must last for 3 years or more; temporary items, such as plastic sheeting used as storm windows, are not eligible. Since the law was passed in 1978, retroactive to 1977, 1978 tax returns may not accurately indicate the extent of tax credits. Greater use of the tax credits may have taken place in more recent years, for which data are not yet available.

### Building Energy Performance Standards

Regulation is another type of incentive. Building Energy Performance Standards (BEPS) were mandated by Congress to achieve energy efficiency in buildings. Through BEPS, the reduction in energy consumed is expected to exceed that created by market forces alone.

DOE has responsibility for developing and issuing standards for new buildings that are to be implemented at the State and local levels through building codes. Interim standards that are applicable only to direct Federal construction will be published by August 1981, with final standards and a report to Congress expected by April 1983. The standards will contain Design Energy Budgets that establish for builders how many Btu's per square foot a building can use. The standards apply to building design, not operation or maintenance.



# RESIDENTIAL ENERGY CONSUMPTION SURVEYS<sup>1</sup>

By Wendel Thompson<sup>2</sup>

Most of the statistics on energy that have been collected by the Government in the past were for the supply and production of energy. Times have changed, and new information is required about the use of energy by the final consumer. The Office of the Consumption Data System, Energy Information Administration, in the U.S. Department of Energy (DOE), is developing procedures for collecting data about the use of energy in the residential, commercial, transportation, and industrial sectors of the economy. This report describes the National Interim Energy Consumption Survey (NIECS), a preliminary survey of residential energy consumption, and plans for future annual residential surveys.

The residential sector<sup>3</sup> consumes about one-fifth of the energy used by consumers.<sup>4</sup> In designing a data-collection effort for this sector, DOE gave top priority to satisfying a multitude of interests that grew out of this country's increasing concern with energy in general. The result was a design to collect data from individual households and to collect billing records from the household's fuel suppliers. A subsample of households also kept diaries on vehicle energy use. Data can be used to fully or partially address the following interests:

- Burden of energy costs on low-income, minority, and elderly persons and families.
- Changing housing stock and use of fuels as they affect forecasts of future energy use.
- Influence of rising energy costs on consumption and conservation activities.

<sup>1</sup>This article is condensed from a paper presented at the Agricultural Outlook Conference in November 1980 at Washington, D.C. Complete copies are available from the Family Economics Research Group (see p. 2 for address). The opinions and conclusions expressed herein are solely those of the author, and should not be construed as representing the opinions or policy of any Agency of the U.S. Government.

<sup>2</sup>Survey statistician, Energy Information Administration, U.S. Department of Energy.

<sup>3</sup>Residential consumption does not include gasoline used for household vehicles.

<sup>4</sup>"Consumers" also includes all end users of energy in industry, business, and transportation.

- Use of automobiles and changes in their fuel efficiency.
- Potential for solar applications.
- Energy use in apartments where households have little direct control over energy use.
- Energy standards for new houses.
- Usefulness of tax credits to promote conservation.

## The National Interim Energy Consumption Survey<sup>5</sup>

The first survey undertaken was called "interim" because some planned features of the Residential Energy Consumption Surveys were not yet in place when data were collected from households in October and November of 1978. The NIECS was a national probability sample of 4,081 successfully completed household interviews. The number of completed interviews represented a response rate of 90.5 percent of all eligible housing units and was achieved through a multiwave, multicontact attempt to reach households, culminating in the use of mail to reach the last 5.3 percent. A \$2 incentive was given to each household to encourage cooperation throughout the whole interview. The 44-minute interview covered: Structural features of the house related to energy, such as size, insulation, and openings; the heating and cooling systems; fuels used and what they were used for; energy conservation efforts; household appliances and vehicles; and demographic data on the household. Near the end of the interview households that paid fuel bills directly to a supplier were asked to sign an authorization that would permit fuel suppliers to provide the household's fuel records for a 15-month period. Most households signed the authorization.

Contacting the fuel suppliers, the next step in data collection, was most important because the use of the actual fuel consumption records for each household made this system of data

<sup>5</sup>Response Analysis Corporation, Princeton, N.J., conducted the fieldwork, including the followup surveys, and played an important role in designing the survey.

collection unique.<sup>6</sup> All electric and gas utility suppliers cooperated, and data were ultimately received for 89 percent of the electrical bills paid directly to the company by the household and for 85 percent of the natural gas bills. Data were collected by mail following initial contacts by telephone or in person. The frequent reasons for missing utility bills were unsigned authorizations and failure to match the authorization with a utility company record. Contacts were less successful for the other fuels; records were acquired for only 64 percent of the fuel oil/kerosene bills and 64 percent of the liquefied petroleum gas (LPG) bills. Contacts with these fuel suppliers typically involved requests for one or two households, and data were collected, after the supplier had received the signed authorizations, by telephone rather than by mail as with the gas and electric companies.

Followup survey efforts were directed to improving the accuracy of data in situations where the household lacked the information, where specially trained interviewers were required, or where maintenance of records was needed in the absence of existing records. In large apartment buildings, for example, renters may not know what fuels are used to heat the building because the fuel bills are hidden costs in their rent. In these cases, an interviewer contacted the rental agent for additional information, which was later incorporated into the data set, and improved the accuracy of the data for rental units.

In another followup effort, a trained technician was sent to 44 households to measure and observe such items as the square footage of living space, temperatures of the hot and cold water, insulation in the walls and attic, and siting of the house. Data from these households will be extremely useful for methodological analyses and improving the data-gathering procedures.

From the sample of households in NIECS, a subsample was designated by DOE to provide information on the personal use of household vehicles.<sup>7</sup> Households in the subsample (House-

hold Transportation Panel) reported fuel purchases, odometer readings, and fuel gauge readings for a 2-month period. Then, 4 months later, households in the panel again reported these data for another 2-month period. Diaries were mailed to households, and data usually were collected by telephone within a few days after the end of each period. This design yielded annual estimates of miles driven, gallons of fuel purchased and consumed, and the efficiency of the vehicle fleet (miles per gallon). Since all vehicles in the household were included with information on year, make, and model of each vehicle, the analysis can focus on the relative usage of vehicles in the same household. In addition, the changing efficiencies of the vehicle fleet, the use of leaded fuels in vehicles designed for unleaded fuels, and the reaction of drivers to the increasing price of gasoline can be examined.

Data from the first reports of the Household Transportation Panel, beginning in June 1979, are now becoming available. During the summer of 1979, some parts of the country experienced shortages of gasoline. The effects of these shortages on driving habits should be reflected in the data.

### Residential Energy Consumption Surveys

Future residential energy consumption surveys will have the following features that will distinguish them from the interim survey:

- Increased coverage of housing units to include those in Alaska and Hawaii and those on military bases and Indian reservations.
- Interviews will be repeated after 2 years for a portion of the sample households to provide data on changes in energy statistics.
- Improved accuracy of important data elements, including actual measurement of the square footage of living space.
- Improved methods of estimating fuel consumption for rental apartments.
- Inclusion of data about the consumption of wood for home heating.
- Use of a specially designed sample of 131 primary sampling locations selected, in part, on the basis of the dominant heating fuel and sampled to produce reliable estimates for 10 Federal regions

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<sup>6</sup>For households whose energy costs were included in their rent or who did not otherwise pay directly, energy consumption was estimated from the data for households that had similar characteristics.

<sup>7</sup>Including company cars and cars not owned by the household.



or 9 census regions when data from 2 survey years are combined.

- Increased sample size of 5,000 households.
- Inclusion of an additional annual sample of 500 households for special methodological studies.

One of the most important projected activities is the development of methods for breaking down fuel records into their most important component end uses (space heating, space cooling, and water heating) for a measure of efficiency for some components. By combining the actual square footage with weather data for the individual household, for example, a figure for the consumption of Btu per square foot per heating degree day could be derived.<sup>8</sup> Engineers could use that figure in evaluating building designs and operations. Then, DOE could chart the changing efficiencies over time, relate these efficiencies to housing and demographic characteristics, and provide data on the relative payoffs of improving the efficiency of household energy use.

#### Public Availability of NIECS Data

The following reports can be ordered from the Superintendent of Documents, U.S. Gov-

<sup>8</sup> Measure of how far the daily average temperature falls below 65 degrees.

ernment Printing Office, Washington, D.C. 20402:

- *Residential Energy Consumption Survey: Conservation*, February 1980, DOE/EIA-0207/3, GPO No. 061-003-00087-8, \$6.
- *Residential Energy Consumption Survey: Characteristics of the Housing Stock and Households, 1978*, February 1980, DOE/EIA-0207/2, GPO No. 061-003-00093-2, \$4.25.
- *Single Family Households: Fuel Inventories and Expenditures: National Interim Energy Consumption Survey*, December 1979, DOE/EIA-0207/1, GPO No. 061-003-0075-4, \$1.75.
- *Residential Energy Consumption Survey: Consumption and Expenditures, April 1978 through March 1979*, July 1980, DOE/EIA-0207/5, GPO No. 061-003-00031-9, \$6.50.
- *Residential Energy Consumption Survey: Consumption Patterns of Household Vehicles, June to August 1979*, June 1980, DOE-EIA-0207/4, GPO No. 061-003-001560-4, \$3.75.

The data set with individual household records on magnetic tape can be ordered from the National Technical Information Services for \$125 (accession No. PB81-108714). Contact Stu Wiseman at (703) 487-4808.

## SOME NEW USDA PUBLICATIONS

(Please give your ZIP code in your return address when you order these.)

The following is for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402:

- IDEAS FOR BETTER EATING—MENUS AND RECIPES TO MAKE USE OF THE DIETARY GUIDELINES. January 1981. \$2.25.

Single copies of the following are available free from the U.S. Department of Agriculture. Please address your request to the office indicated:

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- FAMILY FOOD BUDGETING—FOR GOOD MEALS AND GOOD NUTRITION. Revised November 1980.
- SELECTING AND FINANCING A HOME. G 182. Revised August 1980.
- GROWING VEGETABLES IN THE HOME GARDEN. G 202. Revised September 1980.

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## FAMILIES MAINTAINED BY FEMALE HOUSEHOLDERS, 1970-79

Female householders with no husband present maintained 15 percent (8.5 million) of all U.S. families in 1979.<sup>1</sup> Between 1970 and 1979, the number of these families increased 51 percent but total number of U.S. families increased only 12 percent. Almost two-thirds of the families maintained by female householders were single-parent families (families comprised of a mother and at least one child under 18 with or without other relatives). These mother-child families increased by 81 percent from 1970 to 1979. This increase might be attributed to such factors as child-bearing outside of marriage; the dissolution of nuclear families through separation, divorce, and widowhood; or the desire and ability of women to establish and maintain independent families.

Families maintained by female householders with no husband present were concentrated at the low end of the economic scale. The poverty rate for persons living in these families was 36 percent in 1978 (down from 38 percent in 1969), compared with a 10-percent rate for all persons in families. In 1978, the median income of \$8,540 for families maintained by female householders was less than half of the median income of \$17,640 for all families. In 1978 constant dollars, the median income for all families rose 5 percent from 1969 to 1978, while the median income for families maintained by women did not increase. The presence of children had a negative effect on the level of family income (see table).

In 1979, three out of five female householders who maintained families with no husband present were in the labor force, either employed or looking for employment. The unemployment rate for these women rose from 3 percent in 1970 to 5 percent in 1979. Among female householders who were employed in 1979, most were clerical and service workers.

Only one-fifth of female householders held professional and managerial positions, although the number of women in each of those occupational groups had doubled during the seventies. The increase in the percent of women who entered professional or managerial positions reflected the percent of female householders who attained higher levels of education. In 1970, half of all female householders had finished high school. In 1979, 60 percent had completed at least high school and 23 percent had attended college.

During the seventies, the number of female householders under age 45 grew more rapidly than the number of older female householders, thus lowering the median age of female householders from 48 years in 1970 to 42 in 1979. This change in age composition altered the composition of the group by marital status; the proportion of widows decreased and the proportion of never-married and divorced women increased. Families maintained by women in 1979 were more likely than comparable families in 1970 to include children, but the average number of children per family declined from 2.29 to 1.86.

Type of family	Median income
All female householders, no husband present . . . . .	\$8,540
No children under 18 years . . . . .	11,970
With children under 18 years . . . . .	7,040
All 6 to 17 years . . . . .	8,690
Some under 6, some 6 to 17 years . . . . .	4,930
All under 6 . . . . .	4,500

<sup>1</sup> "Families maintained by female householders with no husband present" replaces the former Bureau of the Census term "female-headed families."

Source: Rawlings, Steve W., 1980, Families maintained by female householders 1970-79, *Current Population Reports, Special Studies, Series P-23*, No. 107, U.S. Department of Commerce, Bureau of the Census.

# NUTRIENT CONTENT OF THE NATIONAL FOOD SUPPLY

"The nutrient content of the national food supply," by Ruth M. Marston and Susan O. Welsh, was published in the Winter 1981 issue of the *National Food Review* (NRD-13). Changes from 1979 to 1980 include 1 to 4 percent increases for food energy (calories), vitamin B<sub>12</sub>, ascorbic acid, vitamin A, fat, and thiamin; and 1 percent decreases for calcium and magnesium. Because of these increases, food energy, fat, and thiamin are now at peak levels. Greater consumption of pork, edible offals, and citrus products contributed to the higher nutrient levels, while decreased consumption of some dairy products, potatoes, and coffee contributed to the lower levels.

Levels and sources of zinc in the Nation's diet were reported for the first time. The zinc level, now 12.5 mg per capita per day, has fluctuated between 11 and 13 mg per day since the period 1909-13. Sources of zinc have changed markedly over the past 70 years because of shifts in consumption of foods from three major food groups that together account for around three-fourths of the zinc in the food supply.

Reprints of this article may be obtained free from the Consumer Nutrition Center, HN-SEA-USDA, room 326, 6505 Belcrest Road, Hyattsville, Md. 20782. Ask for reprint CNC(Adm.)299-15.

## WHO ARE THE UNINSURED?

During the first months of 1977, 26.6 million Americans or approximately 13 percent of the U.S. civilian, noninstitutionalized population had no health insurance coverage. Young adults 18 to 24 years were more likely than other age groups to be uninsured and the elderly, many of whom were eligible for Medicare benefits, were least likely to be uninsured (see table).

When data were classified by families, only 6 percent of the families had no family member insured, 13 percent had at least one member insured, and 81 percent had all members insured. Public health insurance programs, such as Medicaid and Medicare, insure only eligible family members, thereby resulting in uninsured persons in the family. Families enrolled in some private plans may choose between family and individual coverage. Not all employment-related health insurance plans offer family coverage.

Characteristic	Percent of group uninsured
Age	
Less than 6 years . . . . .	12
6-17 years . . . . .	13
18-24 years . . . . .	22
25-54 years . . . . .	12
55-64 years . . . . .	11
65 or more years . . . . .	4
Sex	
Male . . . . .	13
Female . . . . .	12
Color	
White . . . . .	12
Nonwhite . . . . .	18
Years of education	
0-11 . . . . .	16
12 . . . . .	12
13 or more . . . . .	9
U.S. census region	
Northeast . . . . .	8
North Central . . . . .	9
South . . . . .	16
West . . . . .	16

Source: Kasper, Judith A., Daniel C. Waldon, and Gail R. Wilensky, 1980, Who are the uninsured?, *NCHSR National Health Care Expenditures Study*, Data Preview 1, U.S. Department of Health and Human Services, National Center for Health Services Research.

See *Family Economics Review* Spring 1981 issue, p. 36, for dental visits survey from the National Medical Care Expense Survey.

# COST OF FOOD AT HOME, U.S. AND REGIONS

Cost of food at home estimated for food plans at 4 cost levels, March 1981, U.S. average <sup>1</sup>

Sex-age groups	Cost for 1 week			Cost for 1 month		
	Thrifty plan <sup>2</sup>	Low-cost plan	Moderate-cost plan	Liberal plan	Thrifty plan <sup>2</sup>	Low-cost plan
<b>FAMILIES</b>						
Family of 2: <sup>3</sup>						
20-54 years .....	\$32.90	\$42.50	\$53.00	\$63.50	\$142.60	\$183.80
55 years and over .....	29.60	37.80	47.00	55.90	128.40	164.20
Family of 4:						
Couple, 20-54 years and children--						
1-2 and 3-5 years .....	46.70	59.60	74.10	88.50	202.30	258.10
6-8 and 9-11 years .....	56.30	72.10	90.10	107.70	244.10	312.20
<b>INDIVIDUALS <sup>4</sup></b>						
Child:						
7 months to 1 year .....	6.70	8.10	9.90	11.60	29.10	35.00
1-2 years .....	7.60	9.60	11.80	13.90	32.80	41.40
3-5 years .....	9.20	11.40	14.10	16.90	39.90	49.60
6-8 years .....	11.70	14.90	18.60	22.20	50.80	64.50
9-11 years .....	14.70	18.60	23.30	27.80	63.70	80.60
Male:						
12-14 years .....	15.70	19.70	24.70	29.40	67.90	85.60
15-19 years .....	17.20	21.80	27.20	32.60	74.30	94.30
20-54 years .....	16.50	21.30	26.80	32.20	71.40	92.30
55 years and over .....	14.70	18.80	23.40	28.00	63.70	81.60
Female:						
12-19 years .....	13.90	17.60	21.80	25.90	60.20	76.40
20-54 years .....	13.40	17.30	21.40	25.50	58.20	74.80
55 years and over .....	12.20	15.60	19.30	22.80	53.00	67.70
Pregnant .....	16.80	21.40	26.30	31.10	73.00	92.50
Nursing .....	17.90	22.60	28.10	33.40	77.50	98.10

<sup>1</sup>Assumes that food for all meals and snacks is purchased at the store and prepared at home. Estimates for each plan were computed from quantities of foods published in the Winter 1976 (thrifty plan) and Winter 1975 (low-cost, moderate-cost, and liberal plans) issues of Family Economics Review. The costs of the food plans were first estimated using prices paid in 1965-66 by households from USDA's Household Food Consumption Survey with food costs at 4 selected levels. USDA updates these survey prices to estimate the current costs for the food plans using information from the Bureau of Labor Statistics: "Estimated Retail Food Prices by Cities" from 1965-66 to 1977 and "CPI Detailed Report," tables 3 and 9, after 1977.

<sup>2</sup>Coupon allotment in the Food Stamp Program based on this food plan.  
<sup>3</sup>10 percent added for family size adjustment. See footnote 4.

<sup>4</sup>The costs given are for individuals in 4-person families. For individuals in other size families, the following adjustments are suggested: 1-person--add 20 percent; 2-person--add 10 percent; 3-person--add 5 percent; 5- or 6-person--subtract 5 percent; 7- or more-person--subtract 10 percent.



Cost of food at home estimated for food plans at 3 cost levels, March 1981,  
Northeast region<sup>1</sup>

Sex-age groups	Cost for 1 week			Cost for 1 month		
	Low-cost plan	Moderate-cost plan	Liberal plan	Low-cost plan	Moderate-cost plan	Liberal plan
FAMILIES						
Family of 2: <sup>2</sup>						
20-54 years .....	\$44.50	\$57.20	\$69.00	\$192.90	\$247.80	\$299.00
55 years and over .....	39.50	50.30	60.50	171.50	217.80	262.10
Family of 4:						
Couple, 20-54 years and children--						
1-2 and 3-5 years .....	62.30	79.60	96.00	270.20	344.90	416.10
6-8 and 9-11 years .....	75.50	96.80	116.70	326.90	419.10	505.60
INDIVIDUALS <sup>3</sup>						
Child:						
7 months to 1 year .....	8.20	10.30	12.30	35.70	44.80	53.20
1-2 years .....	9.90	12.50	15.00	43.00	54.20	65.10
3-5 years .....	11.90	15.10	18.30	51.80	65.40	79.20
6-8 years .....	15.60	19.90	24.00	67.40	86.00	103.80
9-11 years .....	19.40	24.90	30.00	84.10	107.80	130.00
Male:						
12-14 years .....	20.70	26.40	31.90	89.70	114.60	138.00
15-19 years .....	22.80	29.20	35.30	98.90	126.60	153.00
20-54 years .....	22.40	28.90	35.00	97.00	125.30	151.80
55 years and over .....	19.70	25.10	30.40	85.50	108.90	131.70
Female:						
12-19 years .....	18.40	23.30	28.00	79.60	101.10	121.40
20-54 years .....	18.10	23.10	27.70	78.40	100.00	120.00
55 years and over .....	16.20	20.60	24.60	70.40	89.10	106.60
Pregnant .....	22.30	28.10	33.70	96.60	121.70	145.90
Nursing .....	23.70	30.20	36.10	102.60	130.70	156.60

<sup>1</sup>Assumes that food for all meals and snacks is purchased at the store and prepared at home. Estimates for each plan were computed from quantities of foods published in the Winter 1975 issue of *Family Economics Review*. The costs of the food plans were first estimated using prices paid in 1965-66 by households in the Northeast from the USDA's Household Food Consumption Survey with food costs at 3 selected levels. These prices are updated by use of "Estimated Retail Food Prices by Cities" (Boston; New York, northeastern New Jersey; Philadelphia) released monthly by the Bureau of Labor Statistics.

<sup>2</sup>10 percent added for family size adjustment. See footnote 3.

<sup>3</sup>The costs given are for individuals in 4-person families. For individuals in other size families, the following adjustments are suggested: 1-person--add 20 percent; 2-person--add 10 percent; 3-person--add 5 percent; 5- or 6-person--subtract 5 percent; 7- or more-person--subtract 10 percent.

Cost of food at home estimated for food plans at 3 cost levels, March 1981,  
North Central region<sup>1</sup>

Sex-age groups	Cost for 1 week			Cost for 1 month		
	Low-cost plan	Moderate- cost plan	Liberal plan	Low-cost plan	Moderate- cost plan	Liberal plan
<b>FAMILIES</b>						
Family of 2: <sup>2</sup>						
20-54 years .....	\$43.70	\$53.70	\$64.90	\$188.80	\$232.50	\$281.50
55 years and over .....	38.90	47.40	57.30	168.70	205.50	247.90
Family of 4:						
Couple, 20-54 years and children--						
1-2 and 3-5 years .....	61.50	75.30	90.80	265.90	325.90	393.40
6-8 and 9-11 years .....	74.50	91.60	110.60	322.30	397.00	479.80
<b>INDIVIDUALS <sup>3</sup></b>						
Child:						
7 months to 1 year .....	8.30	9.90	11.70	35.90	43.10	50.90
1-2 years .....	9.90	12.00	14.30	42.80	51.80	61.80
3-5 years .....	11.90	14.50	17.50	51.50	62.70	75.70
6-8 years .....	15.50	19.00	22.90	67.00	82.40	99.40
9-11 years .....	19.30	23.80	28.70	83.70	103.20	124.50
Male:						
12-14 years .....	20.50	25.20	30.40	88.90	109.20	131.70
15-19 years .....	22.50	27.70	33.60	97.60	120.20	145.50
20-54 years .....	21.90	27.10	32.90	94.70	117.50	142.70
55 years and over .....	19.30	23.60	28.70	83.80	102.40	124.20
Female:						
12-19 years .....	18.30	22.20	26.70	79.10	96.30	115.80
20-54 years .....	17.80	21.70	26.10	76.90	93.90	113.20
55 years and over .....	16.10	19.50	23.40	69.60	84.40	101.20
Pregnant .....	21.90	26.50	31.90	95.00	115.00	138.20
Nursing .....	23.30	28.40	34.20	100.70	123.20	148.10

<sup>1</sup>Assumes that food for all meals and snacks is purchased at the store and prepared at home. Estimates for each plan were computed from quantities of foods published in the Winter 1975 issue of Family Economics Review. The costs of the food plans were first estimated using prices paid in 1965-66 by households in the North Central region from the USDA's Household Food Consumption Survey with food costs at 3 selected levels. These prices are updated by use of "Estimated Retail Food Prices by Cities" (Chicago, Cleveland, Detroit, St. Louis) released monthly by the Bureau of Labor Statistics.

<sup>2</sup>10 percent added for family size adjustment. See footnote 3.

<sup>3</sup>The costs given are for individuals in 4-person families. For individuals in other size families, the following adjustments are suggested: 1-person--add 20 percent; 2-person--add 10 percent; 3-person--add 5 percent; 5- or 6-person--subtract 5 percent; 7- or more-person--subtract 10 percent.

Cost of food at home estimated for food plans at 3 cost levels, March 1981,  
Southern region<sup>1</sup>

Sex-age groups	Cost for 1 week			Cost for 1 month		
	Low-cost plan	Moderate-cost plan	Liberal plan	Low-cost plan	Moderate-cost plan	Liberal plan
<b>FAMILIES</b>						
Family of 2: <sup>2</sup>						
20-54 years .....	\$42.60	\$53.00	\$62.90	\$184.30	\$229.60	\$273.10
55 years and over .....	37.70	46.40	55.00	163.50	201.10	238.30
Family of 4:						
Couple, 20-54 years and children--						
1-2 and 3-5 years .....	59.50	73.70	87.50	257.60	319.30	379.70
6-8 and 9-11 years ....	72.10	89.70	106.60	312.00	388.80	462.30
<b>INDIVIDUALS <sup>3</sup></b>						
Child:						
7 months to 1 year .....	7.90	9.70	11.30	34.40	41.90	49.00
1-2 years .....	9.40	11.50	13.60	40.90	50.00	59.00
3-5 years .....	11.40	14.00	16.70	49.20	60.60	72.40
6-8 years .....	14.80	18.40	21.90	64.10	79.90	95.00
9-11 years .....	18.60	23.10	27.50	80.40	100.20	119.00
Male:						
12-14 years .....	19.80	24.60	29.20	85.70	106.40	126.60
15-19 years .....	21.90	27.20	32.40	94.70	117.80	140.50
20-54 years .....	21.30	26.70	31.80	92.20	115.60	138.00
55 years and over .....	18.70	23.10	27.50	81.00	100.00	119.10
Female:						
12-19 years .....	17.80	21.80	25.90	77.10	94.70	112.10
20-54 years .....	17.40	21.50	25.40	75.30	93.10	110.30
55 years and over .....	15.60	19.10	22.50	67.60	82.80	97.50
Pregnant .....	21.50	26.30	31.10	93.10	114.20	134.80
Nursing .....	22.80	28.20	33.30	98.70	122.20	144.30

<sup>1</sup>Assumes that food for all meals and snacks is purchased at the store and prepared at home. Estimates for each plan were computed from quantities of foods published in the Winter 1975 issue of Family Economics Review. The costs of the food plans were first estimated using prices paid in 1965-66 by households in the South from the USDA's Household Food Consumption Survey with food costs at 3 selected levels. These prices are updated by use of "Estimated Retail Food Prices by Cities" (Atlanta; Baltimore; Washington, D.C.; Maryland; Virginia) released monthly by the Bureau of Labor Statistics.

<sup>2</sup>10 percent added for family size adjustment. See footnote 3.

<sup>3</sup>The costs given are for individuals in 4-person families. For individuals in other size families, the following adjustments are suggested: 1-person--add 20 percent; 2-person--add 10 percent; 3-person--add 5 percent; 5- or 6-person--subtract 5 percent; 7- or more-person--subtract 10 percent.



Cost of food at home estimated for food plans at 3 cost levels, March 1981,  
Western region<sup>1</sup>

Sex-age groups	Cost for 1 week			Cost for 1 month		
	Low-cost plan	Moderate-cost plan	Liberal plan	Low-cost plan	Moderate-cost plan	Liberal plan
<b>FAMILIES</b>						
Family of 2: <sup>2</sup>						
20-54 years .....	\$43.00	\$53.90	\$65.00	\$186.20	\$233.30	\$281.70
55 years and over .....	38.40	47.40	57.20	166.30	205.70	247.60
Family of 4:						
Couple, 20-54 years and children--						
1-2 and 3-5 years .....	60.70	75.50	91.30	262.90	326.90	395.70
6-8 and 9-11 years ....	73.70	92.00	111.30	319.00	398.50	482.30
<b>INDIVIDUALS <sup>3</sup></b>						
Child:						
7 months to 1 year .....	8.20	9.90	12.10	35.70	42.90	52.50
1-2 years .....	9.80	12.00	14.50	42.50	51.90	62.90
3-5 years .....	11.80	14.50	17.70	51.10	62.90	76.70
6-8 years .....	15.40	19.10	23.20	66.50	82.70	100.50
9-11 years .....	19.20	23.90	29.00	83.20	103.70	125.70
Male:						
12-14 years .....	20.40	25.40	30.70	88.30	109.90	133.20
15-19 years .....	22.30	27.80	33.80	96.50	120.50	146.50
20-54 years .....	21.60	27.20	32.90	93.50	117.80	142.60
55 years and over .....	19.10	23.60	28.60	82.60	102.50	123.80
Female:						
12-19 years .....	18.10	22.40	27.00	78.60	96.90	117.20
20-54 years .....	17.50	21.80	26.20	75.80	94.30	113.50
55 years and over .....	15.80	19.50	23.40	68.60	84.50	101.30
Pregnant .....	21.60	26.70	32.00	93.70	115.60	138.80
Nursing .....	22.90	28.60	34.30	99.30	123.80	148.70

<sup>1</sup>Assumes that food for all meals and snacks is purchased at the store and prepared at home. Estimates for each plan were computed from quantities of foods published in the Winter 1975 issue of Family Economics Review. The costs of the food plans were first estimated using prices paid in 1965-66 by households in the West from the USDA's Household Food Consumption Survey with food costs at 3 selected levels. These prices are updated by use of "Estimated Retail Food Prices by Cities" (Los Angeles, San Francisco, Oakland) released monthly by the Bureau of Labor Statistics.

<sup>2</sup>10 percent added for family size adjustment. See footnote 3.

<sup>3</sup>The costs given are for individuals in 4-person families. For individuals in other size families, the following adjustments are suggested: 1-person--add 20 percent; 2-person--add 10 percent; 3-person--add 5 percent; 5- or 6-person--subtract 5 percent; 7- or more-person--subtract 10 percent.

## CONSUMER PRICES

Consumer Price Index for all urban consumers  
(1967 = 100)

Group	Mar. 1981	Feb. 1981	Jan. 1981	Mar. 1980
All items .....	265.1	263.2	260.5	239.8
Food .....	272.2	270.8	268.6	247.3
Food at home .....	268.6	267.3	265.6	243.6
Food away from home .....	286.1	284.7	280.9	260.9
Housing .....	282.6	280.9	279.1	254.5
Shelter .....	301.6	300.5	300.1	271.6
Rent .....	203.0	201.9	200.9	186.6
Homeownership .....	336.8	335.8	335.8	302.0
Fuel and other utilities ..	308.4	304.5	296.7	268.0
Fuel oil, coal, and bottled gas .....	693.4	675.6	625.9	553.4
Gas (piped) and electricity .....	326.7	322.9	318.5	284.0
Household furnishings and operation .....	216.9	214.9	212.6	201.3
Apparel and upkeep .....	185.1	182.0	181.1	176.0
Men's and boys' apparel ..	175.0	171.6	171.1	165.6
Women's and girls' apparel	157.5	153.4	152.1	155.5
Footwear .....	197.4	194.9	194.9	187.0
Transportation .....	273.5	270.9	264.7	243.7
Private .....	271.7	269.4	262.9	244.0
Public .....	293.9	288.1	286.4	232.1
Medical care .....	284.7	282.6	279.5	260.2
Entertainment .....	218.2	216.7	214.4	200.6
Other goods and services ...	228.7	227.4	226.2	208.9
Personal care .....	226.9	224.6	222.5	208.1

Source: U.S. Department of Labor, Bureau of Labor Statistics.

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*SUMMER 1981*

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